



National  
Taiwan  
University



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# V. COLLEGE OF ENGINEERING



## Academic Units

- Civil Engineering
- Mechanical Engineering
- Chemical Engineering
- Engineering Science & Ocean Engineering
- Materials Science & Engineering
- Environmental Engineering
- Applied Mechanics
- Building & Planning Industrial Engineering
- Industrial Engineering
- Biomedical Engineering
- Polymer Science & Engineering

## RESEARCH CENTERS

- Yen Tjing Ling Industrial Research Institute
- Hydrotech Research Institute
- Earthquake Engineering Research Center
- Manufacturing Automation Technology Research Center (MATRC)
- Industrial Knowledge Technology Research Center (IKTRC)
- Petrochemical Industry Research Center
- Nano Electro-Mechanical
- System Research Ship Technology Research Center
- Advanced Polymers Nanotechnology Research Center
- Environmental Pollution Prevention & Control Technology Research Center
- Rehabilitation Engineering Research Center

## The Present & Former Deans

Tze-Hong Lu	(1945-1946)	Tung-Ying Wung	(1979-1985)
Ngou-Shou Wai	(1946-1948)	Chun-Tsung Wang	(1985-1990)
Jeou-Shen Pern	(1948-1953)	Chin-Lien Yen	(1990-1993)
Chen-Hsing Yen	(1953-1955)	Yih-Nan Chen	(1993-1999)
Kow-Kung Choong	(1955-1965)	Yeong-Bin Yang	(1999-2005)
Tsu-Nien Chin	(1965-1972)	Huan-Jang Keh	(2005-present)
Chao-Chung Yu	(1972-1979)		

## HISTORY

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After the retrocession of Taiwan to the Republic of China in 1945, Taihoku Imperial University became National Taiwan University. The College of Engineering began with four departments: Civil Engineering, Mechanical Engineering, Electrical Engineering, and Chemical Engineering. The Department of Naval Architecture was established in 1976, and renamed the Department of Naval Architecture and Ocean Engineering in 1993, and the Department of Engineering Science and Ocean Engineering in 2002. In addition, the Department of Computer Science and Information Engineering and the Department of Materials Science and Engineering were established in 1977 and 2001, respectively.

Graduate programs began with Electrical Engineering in 1947, Civil Engineering in 1960, Chemical Engineering in 1964, Mechanical Engineering in 1966, Naval Architecture in 1973, Environmental Engineering in 1977, Computer Science and Information Engineering in 1981, Material Science and Engineering in 1982, Applied Mechanics in 1984, Building and Planning in 1988, Electro-optical Engineering in 1992, Industrial Engineering in 1994, Biomedical Engineering in 1998, and Polymer Science and Engineering in 2002.

In 1997, the Graduate Institute of Electro-optical Engineering and the Department of Electrical Engineering were spun off to form an independent college, the College of Electrical Engineering. In August 2000, the Department of Computer Science and Information Engineering was merged into the College of Electrical Engineering, which was renamed as the College of Electrical and Information Engineering.

## FACILITIES

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The College of Engineering is currently composed of five departments, six graduate institutes, and eleven research centers. The research centers include the Yen Tjing-Ling Industrial Research Institute, the Center for Earthquake Engineering Research, the Manufacturing Automation Technology Research Center, the Center of Industrial Knowledge Technology Research, the Research Center for Petrochemical Industry, the Nano Electro-mechanical System Research Center, the Ship Technology Research Center, the Advanced Polymer Nano-Technology Research Center, the Environmental Pollution Prevention and Control Technology Research Center, the Rehabilitation Engineering Research Center and the Advanced Hydrotech Research Institute, a joint operation of the College of Engineering and the College of Bio-Resources and Agriculture. The College approximates a standard university in size and scope.



## RESEARCH

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Graduate students in College of Engineering approximately accounts for 20 percentages of every College in National Taiwan University.

The annual budget exceeding one thousand million research expenditures for over 600 research projects and over 70 pieces of invention as well as nearly ten million dollars income of technology transfers feature applied science in the College of Engineering. 923 SCI journal papers were published by the College of Engineering in 2008 and 3.6 papers for each teacher in average. It can be seen the clue that the research atmosphere grow prosperously.

The research highlights of the College of Engineering include: Innovative Experimental Techniques and Scientific Computational Methods for Geotechnical and Structural Engineering (Dep. Civil Engineering), Building the FORMOSUN Solar Vehicle into World Contests (Dep. Mechanical Engineering), Green Production Technology for the Future Chemical Engineering (Dep. Chemical Engineering), Scientific Computation and Simulation with various Novel Applications (Dep. Eng. Sci. & Ocean Eng.), Integrated Research on Key Technologies of Submarine (Dep. Eng. Sci. & Ocean Eng.), Molecular Modeling for the Development of New Materials with Novel Electrical, Optical and Biocompatible Properties (Dep. Mat. Sci. and Eng.), Synthesis of Nanoparticles and

Novel Structures for Electro-Optical Applications (Dep. Mat. Sci. and Eng.), Monitoring, Control and Evaluation of Environmental Hormone (Inst. Environmental Eng.), Smart Sensor System for Future Life Applications (Inst. Applied Mechanics), Non-invasive Diagnostic Techniques for Cancers and Diabetic Foot Microcirculation (Inst. Applied Mechanics), Biomaterials in Artificial Organs and Drug Delivery System (Inst. Biomedical Eng.), Advanced Optoelectronic Polymers and Nanotechnology (Inst. Polymer Sci. and Eng.).

## GOALS

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### Vision of the College of Engineering

To be one of the world's premier engineering schools.

### Mission of the College of Engineering

The mission of the College of Engineering is to provide an environment where education and research can complement and enhance one another. We strive to provide the highest quality of education by constantly improving course curricula, cultivating both fundamentals and specializations, promoting ethics and social responsibility, as well as enhancing international vision and leadership, to produce outstanding engineers and researchers who can tackle the demands of national infrastructure and technology advancement. In research, we are dedicated to developing engineering-related

fields, emphasizing both basic and applied research, and strengthening collaboration with industry to enhance both quantity and quality of research, in order for each of the College's academic fields to attain world-class standards as well as domestic leadership.

## CONTACT INFORMATION

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Established in: 1943

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NTUCOE, NTUEECS and UDCE sign academic agreements for student exchange and a dual degree program

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# 1. DEPARTMENT OF CIVIL ENGINEERING

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## INTRODUCTION

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The Department of Civil Engineering at NTU was established in 1943. It offers both undergraduate and graduate programs in civil engineering, as well as research opportunities for the society and the nation. It is recognized as the largest and leader among all of the civil engineering departments in the nation.

The Department offers the undergraduate program of study leading to the degree of Bachelor of Science and graduate program leading to the degrees of Master of Science and Doctor of Philosophy. It has an enrollment of approximately six hundred undergraduate students and three hundred and fifty graduate students, about one fifth of the latter being doctoral students. The Department has long been actively engaged in academic research and keeps a close cooperative relation with industry and government agencies; it holds a research fund on the order of 2 million US dollars per annum.

Department teaching and research activities can be categorized into six major areas, namely, geotechnical engineering, structural engineering, hydraulic engineering, transportation engineering, computer-aided engineering, and construction management,

plus surveying. Currently, an architectural engineering program is under development. The Department also collaborates in many areas with the Institute of Environmental Engineering, Institute of Applied Mechanics, and Institute of Building and Planning, sharing with these institutes several of its faculty members. The Department of Civil Engineering works closely with other research organizations on major research projects. These organizations include the Hydraulic Research Laboratory, NTU Center for Earthquake Engineering Research, Tjing Ling Industrial Research Institute, National Center for Research on Earthquake Engineering, National Center for High Performance Computing, the Taiwan Construction Research Institute, etc. Many major constructions in this country were based on the research results carried out jointly by this Department and the aforementioned organizations.

## FACULTY

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Full-time: 58

Part-time: 20

Ph.D. Degree: 70

M.S. Degree: 8

### Chair/ Professor

Kuo-Chun Chang Ph.D., SUNY, Buffalo, USA

### Full-time

#### Professors

Yue-Hwa Yu D.Sc., Washington Univ. St. Louis, U.S.A.

I-Chau Tsai M.S., NTU, R.O.C.

Tien-Li Lung Ph.D., New York Univ., U.S.A.

Yi-Hwa Chou M.S., NTU, R.O.C.

Der-Liang Young Ph.D., Cornell Univ., U.S.A.

Hong-Ki Hong Ph.D., Columbia Univ., U.S.A.

Rong-Her Chen Ph.D., Purdue Univ., U.S.A.

R.Y. Tan Ph.D., Columbia Univ., U.S.A.

Yeong-Bin Yang Ph.D., Cornell Univ., U.S.A.

Chu-Joe Hsia Ph.D., UC Berkeley, U.S.A.

Cheng-Hsing Chen Ph.D., UC Berkeley, U.S.A.

Jenn-Chuan Chern Ph.D., Northwestern Univ., U.S.A.

Gwo-Fong Lin Ph.D., Univ. of Pittsburgh, U.S.A.

Chin-Hsiung Loh Ph.D., NTU, R.O.C.

Tsan-Hwei Huang Ph.D., NTU, R.O.C.

Ting-Kuei Tsay Ph.D., Cornell Univ., U.S.A.

Hong-Yuan Lee Ph.D., Univ. of Iowa, U.S.A.

Liang-Hsiung Huang Ph.D., Univ. of Iowa, U.S.A.

Keh-Chyuan Tsai Ph.D., UC Berkeley, U.S.A.

Meei-Ling Lin Ph.D., Univ. of Texas, Austin, U.S.A.

Shyue-Koong Chang Ph.D., Univ. of Maryland, U.S.A.

Chien-Yuan Lin Ph.D., Univ. of Washington, U.S.A.

Cheng-Fang Lin Ph.D., Univ. of Washington, U.S.A.

Chia-Pei Chou Ph.D., Univ. of Texas, Austin, U.S.A.

Ko-Fei Liu Ph.D., MIT, U.S.A.

Feng-Tyan Lin Ph.D., Northwestern Univ., U.S.A.

Liang-Jenq Leu Ph.D., Cornell Univ., U.S.A.

Tang-Hsien Chang Ph.D., NTU, R.O.C.

Sy-Jye Guo Ph.D., Univ. of Texas, Austin, U.S.A.

Shang-Hsien Hsieh Ph.D., Cornell Univ., U.S.A.

Fu-Shu Jeng Ph.D., MIT, U.S.A.

Yin-Wen Chan Ph.D., Univ. of Michigan, U.S.A.

Hui-Ping Tserng Ph.D., Univ. of Wisconsin, Madison, U.S.A.

Lai-Yun Wu M.S. NTU, R.O.C.

Liang-Chun Chen Ph.D., Waseda Univ., Japan

Luh-Maan Chang Ph.D., Univ. of Texas, Austin, U.S.A.

Shyh-Jiann Hwang Ph.D., UC Berkeley, U.S.A.

Ming-Lang Lin Ph.D., NTU, R.O.C.

Nien-Sheng Hsu Ph.D., UCLA, U.S.A.

Herve Capart Ph.D., Univ. Catholique de Louvain, Belgium  
 Chein-Shan Liu Ph.D., NTU, R.O.C.  
 Sih-Li Chen Ph.D., Univ. of California at Berkeley, U.S.A.

#### Associate Professors

Tien-Hsiung Tso M.S., British Columbia Univ., Canada  
 Tim Hau Lee Ph.D., Univ. of Iowa, U.S.A.  
 Tien-Pen Hsu Ph.D., Karlsruhe Univ., Germany  
 Chuin-Shan Chen Ph.D., Cornell Univ., U.S.A.  
 Shih-Ping Ho Ph.D., Univ. of Illinois at Urbana-Champaign, U.S.A.  
 Jen-Jer Jaw Ph.D., Ohio State Univ., U.S.A.  
 Jianye Ching Ph.D., Univ. of California at Berkeley U.S.A.  
 Chung-Che Chou Ph.D., University of California, San Diego  
 Wan-Shan Tsai Ph.D., Univ. of Illinois at Urbana-Champaign, U.S.A.  
 Chen, Po-Han Ph.D., Purdue Univ., U.S.A.  
 Herng-Dar Bih Ph.D., The City University of New York, New York, U.S.A.

#### Assistant Professors

Shih-Chung Kang Ph.D., Stanford Univ., U.S.A.  
 Jen-Yu Han Ph.D., Purdue Univ., U.S.A.  
 Pai-Hui Hsu Ph.D., National Cheng Kung Univ.

Yung-Cheng Lai Ph.D., Univ. of Illinois at Urbana-Champaign, U.S.A.  
 Jiing-Yun You Univ. of Illinois at Urbana-Champaign, U.S.A

#### Part-Time

##### Professors:

Ju-Jiang Hung M.Phil., Univ. of London  
 Chia-Juch Chang Ph.D., Purdue Univ.  
 San-Cheng Chang Ph.D., Cornell Univ.  
 Lap-Lai Chung Ph.D., SUNY Buffalo  
 Chen-Chang Kao M.S. NTU  
 Ching-Churn Chen M.S. Northwestern Univ.  
 Ching Lung Liao Ph.D., NTU  
 Yen-Liang Yin Ph.D., National Chengchi Univ.  
 Yung-Hsiang Chen Ph.D., UC Berkeley, USA  
 Chan-Shiung Yeh Ph.D., Cornell Univ., U.S.A  
 Tzou-Shin Ueng Ph.D., UC Berkeley, U.S.A

##### Associate Professors:

Dyi-Wei Chang M.S. Tohoku Univ. Japan  
 Kung Wang Ph.D., MIT  
 Ming-Teh Wang Ph.D., MIT  
 HU SHAO MIN Ph.D., AIT, Thailand

##### Assistant Professor:

Jen-Diann Chiou Ph.D., MIT  
 Jian-Neng Wang Ph.D., Univ. of Texas, Austin

##### Adjunct Professional Expert

Tsung-Chung Kao Ph.D., Univ. of California at Berkeley U.S.A.  
 Teseng-Dar-Jen Ph.D., Univ. of California at Berkeley U.S.A.  
 Nelson N.S Chou Ph.D., Univ. of Colorado U.S.A.

## FACILITIES

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The main buildings utilized by the Department include the Civil Engineering Building, the new building. The total floor space for research and teaching facilities is 12,350 square meters. The main facilities include research laboratories, faculty and staff offices, seminar rooms, regular classrooms, and one multimedia classroom. The multimedia classroom seats more than 100 students and is equipped with an audio mixer, an amplifier, a DVD player, a transparency projector, a video projector, a slide projector, and a state-of-the-art computer system. Other facilities serving the teaching and research needs of the faculty and students include scanners, digital cameras, VCD and DVD recorders, multimedia video projectors, poster printers, and laser printers.

## COURSES

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### Undergraduate programs

Student Service Education(0), Calculus(8), General Physics(6), General Physics Lab.(2), General Chemistry(4), General Chemistry Lab. (2), Introduction to Engineering(1), Applied Mechanics(3), Surveying(2), Engineering Mathematics(6), Mechanics of Materials(4), Engineering Statistics(3), Computer Programming(3), Transportation Engineering (3), Practice in Surveying(1), Soil Mechanic (3), Engineering Materials(2), Fluid Mechanic (3), Engineering Material and Soil Mechanics Lab.(1), Structural Theory(3),Surveying Engineering(3), Transportation Systems(3), Engineering Graphics(2), Reinforced Concrete(3), Structural Engineering and Fluid Mechanics Lab.(1), Hydrology(3), Foundation Engineering(3), Environmental Engineering A (3), Architectural Engineering(3),Engineering Economics (2), Hydraulic Engineering (2),Water Resources Engineering (3),Environmental Engineering B(3), Construction Management (3), Engineering Geology and Its Applications(3),Introduction To Computer-Aided Engineering(3), Design of Steel Structure(3),Surveying Practice(2), Object-Oriented Programming(3),Visualization in Architecture Engineering Construction(3),Railroad Transportation Engineering(3),High Speed Rail Engineering(3)

## Graduate programs

As for graduate studies, the program leading to the Master's degree requires a minimum of 24 credits, excluding graduate seminars and degree thesis. Courses intended exclusively for graduate students are offered in addition to those open to both graduate and undergraduate students. The students are free to choose the courses offered by the Department, as well as those provided throughout the University, depending on their academic interest and career goal. The Department offers more than one hundred elective courses each academic year.

Unlike those entering the master's program, a student entering the Ph.D. program does not have to select a major field of study beforehand. However, he/she has to take the qualifying examination after one year of residence. A student has to pass the qualifying examination within four semesters of entering the program to be admitted as a formal Ph.D. candidate. He/She can then work under the guidance of his/her advisor to prepare for his/her dissertation. Taking the core courses and then completing a dissertation approved by a Ph.D. committee, a Ph.D. student can typically complete his/her study within five years of obtaining the B.S. degree, or three to four years after receiving the M.S. degree.

## ACADEMIC ACTIVITIES

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1. Each division of the Department holds weekly seminars with distinguished speakers from both university and industry. In addition, each division hosts several seminars and workshops on some selected topics to promote academic exchange.
2. The Department hosts two to three large-scale international conferences to pursue academic excellence and to gain international reputation.
3. The Department invites several distinguished foreign scholars each year to enhance international academic cooperation through visits, teaching and seminars. Also, the faculty of the Department and the Civil Engineering Departments of Kyoto University, Korea Advanced Institute of Science and Technology and National University of Singapore take turns hosting an annual workshop on civil engineering. In addition, regular workshops are held with the Department and the Civil Engineering Departments of Tongji University, Tsinghua University, and Hong Kong University of Science and Technology. Finally, the Department has signed letters of intent with National University of Singapore, Nanyang Technological University, City University of Hong Kong, Norwegian Geotechnical Institute and Universit Catholique de Louvain.

## CAREER AND FURTHER STUDIES

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### ■ Professional abilities

- (1) Foundation engineering: applied mechanics, mechanics of materials and continuum mechanics.
- (2) Structural engineering: structural analysis, steel structures design, steel and prestressed concrete design, earthquake resistance engineering.
- (3) Hydraulic engineering: hydrology, fluid mechanics and hydraulic works design.
- (4) Soil engineering: soil mechanics, foundation design and tunnel engineering.
- (5) Transportation engineering: transportation system, transportation design and management.
- (6) Construction management: project engineering management, construction finance and management, architectural engineering.
- (7) Computer-aided design: computer: computer application in civil engineering, engineering graphics, construction automation.
- (8) Surveying engineering: surveying, surveying practice.

### ■ Further studies

- (1) Civil Engineering
- (2) Applied Mechanics
- (3) Environmental Engineering
- (4) Building and Planning
- (5) Aeronautics and Astronautics
- (6) Biomedical Engineering
- (7) Materials Science and Engineering

- (8) Transportation Engineering

### ■ Career options

The graduates are trained to work in the professional fields of structural engineering, architectural engineering, hydraulic engineering, soil engineering and transportation engineering offered by government units, private enterprise, and research institutes.

### ■ Qualifications

Civil engineer, structural engineer, architect, geotechnical engineer, hydraulic engineer, environmental engineer, traffic engineer, survey engineer, urban planning engineer, refrigeration air-conditioning engineer, industrial safety engineer, industrial hygiene engineer, mining safety engineer.

## CONTACT INFORMATION

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Established in: 1945

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## 2. DEPARTMENT OF MECHANICAL ENGINEERING

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### INTRODUCTION

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The Department of Mechanical Engineering was established in 1943. The educational objective of the department is “to train outstanding mechanical engineers with foresights and leadership in the mechanical engineering and technological industry.” Under this objective, the department has nurtured numerous leading talents for the mechanical engineering and precision electro-mechanical industry in Taiwan. To establish a world-class educational and research environment, the department has acquired the engineering accreditation in 2006. In the educational aspect, besides continuing improving the traditional mechanical engineering courses in areas of the solid mechanics, mechanical design, manufacturing, thermo-fluid science, and system control, the department also works hard in establishing multi-disciplinary courses such as the nanotechnology, integrated-circuit design, bioengineering, MEMS, optical-electro and flat display technology, polymer technology, leadership learning, RFID, new energies, precision machining, bio-chip, intelligent robotics, and so on, upon the request of the modern industry. To catch up with the progress of international mechanical engineering industry and technology, the department has promoted its research ability in the fields of precision nano-manufacturing, new energy technologies,

intelligent robotics, automation of plants, CAD/CAM, precision measuring and machining, mechanical-electro integration, MEMS, nanotechnologies, clean room technologies, fuel cells, multi-powered cars, next-generation engine and combustion technologies, equipments of semiconductor manufacturing, biomechanics, bio-chips, physiotherapy, robotics, RFID, flexible electronics, solar cars, wind power, intelligent cars, etc. The achievement is impressive. The department publishes around 100 journal papers cited by the Science Citation Index and obtains 5 to 10 patents, including 32 outstanding journal papers and 33 excellent journal papers in 2008. So far, the department has won 20 Distinct Researcher Awards with special appointment from the National Science Council (NSC), 32 NSC Outstanding Research Awards, 2 Tung-Yuan Technology Awards, 2 Distinct Engineering Professor Awards from the Chinese Institute of Engineering, 3 Distinct Engineering Professor Awards from Chinese Society of Mechanical Engineering, 2 Automation Medals from the Society of Automation in Taiwan, 4 Tso-Tsu-Chang Regius Professor, 1 Shen-Gen Professorship from the Ministry of Economy, and 9 Distinct Professorships from the National Taiwan University.

## FACULTY

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Distinguished Research Chair Professor : 1

Full-time: 51

Part-time: 6

### Chairman

Shuo-Hung Chang, Professor

Ph.D., Univ. of Cincinnati

### Vice Chairman

Yao-Joe Yang, Professor

Ph.D., MIT, U.S.A.

### Distinguished Research Chair Professor

Chih-Ming Ho Ph.D., Univ. of John Hopkins.

### Professors

Shyan-Fu Chou Ph.D., Lehigh Univ., U.S.A

Bin-Juine Huang M.S., Case Western Reserve Univ., U.S.A.

Yuan-Fang Chou Ph.D., Purdue Univ., U.S.A.

Shyi-Kann Wu Ph.D., Univ. of Illinois, U.S.A.

Yung-Ning Pan Ph.D., Univ. of Wisconsin, U.S.A.

Yunn-Shiuan Liao Ph.D., Univ. of Wisconsin, U.S.A.

Ruey-Hor Yen Ph.D., West Virginia Univ., U.S.A.

Kuang-Chao Fan Ph.D., Univ. of Manchester, England

Chien-Ching Ma Ph.D., Brown Univ., U.S.A.

Chun-Liang Lai Ph.D., Case Western Reserve Univ., U.S.A.

Chin-Chia Su Ph.D., Univ. of Cambridge, England

Wen-Fang Wu Ph.D., Univ. of Illinois, U.S.A.

Hang-Pang Huang Ph.D., Univ. of Michigan-Ann Arbor, EE, U.S.A

Sih-Li Chen Ph.D., Univ. of California, U.S.A.

Yong-Chwang Chen Ph.D., NTU, R.O.C.

Chow-Shing Shin Ph.D., Univ. of Cambridge, England

Hong-Tsu Young Ph.D., Univ. of New South Wales, Australia

Hsiao-Kang Ma Ph.D., Univ. of Illinois, U.S.A.

Ping-Hei Chen Ph.D., Univ. of Minnesota, U.S.A.

Yee-Pien Yang Ph.D., Univ. of California, U.S.A.

Jung-Ho Cheng Ph.D., Univ. of Michigan, U.S.A.

Ching-Hua Wang Ph.D., Northwestern Univ., U.S.A.

Yau-Ming Chen Dr. Ing., Technical University Munich, Germany

Jia-Yush Yen Ph.D., Univ. of California, U.S.A.

Sen-Yeu Yang Ph.D., Univ. of Minnesota, U.S.A

Min-Shin Chen Ph.D., Univ. of California, U.S.A.

Fuh-Kuo Chen Ph.D., Univ. of California, U.S.A.

Jen-San Chen	Ph.D., Univ. of California, U.S.A.
Chun-Fong You	Ph.D., Cranfield Institute of Technology, U.K.
Dar-Zen Chen	Ph.D., Univ. of Maryland, U.S.A.
Su-Hua Hsieh	Ph.D., Univ. of Wisconsin, U.S.A.
Tzu-Yin Wu	Ph.D., Cornell Univ., U.S.A.
Mei-Jiau Huang	Ph.D., California Institute of Technology, U.S.A.
Jing-Tang Yang	Ph.D., Univ. of Wisconsin, U.S.A.
Kuang-Yuh Huang	Dr.Ing., Technical Univ., Berlin, Germany
Jyh-Jone Lee	Ph.D., Univ. of Maryland, U.S.A.

#### Associate Professors

Tien-Tung Chung	Ph.D., NTU, R.O.C.
Tyng Liu	Ph.D., Rutgers Univ., U.S.A.
Han-Ming Chen	Ph.D., Univ. of California, U.S.A.
Chung-Jen Lu	Ph.D., Univ. of California, U.S.A.
Shiang-Fong Chen	Ph.D., Iowa Univ., U.S.A.
Fu-Cheng Wang	Ph.D., Univ. of Cambridge, England
Wen-Pin Shih	Ph.D., Univ. of Cornell, U.S.A.
Yao-Yang Tsai	Ph.D., Univ. of Tokyo, Japan
Kuo-Long Pan	Ph.D., Univ. of Princeton, U.S.A.

Hao-Ming Hsiao	Ph.D., Northwestern Univ., U.S.A.
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#### Assistant Professors

Fu-Ling Yang	Ph.D., California Institute of Technology, U.S.A.
Pei-Chun Lin	Ph.D., Univ. of Michigan, U.S.A.
Pei-Chen Su	Ph.D., Univ. of Stanford, U.S.A.

#### Adjunct professor

Yuan-Mao Huang	Ph.D., Purdue Univ., U.S.A.
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#### Adjunct Associate Professor

Chien-Yi Wang	Ph.D., Univ. of Tokyo, Japan
Shun-Tong Chen	Ph.D., National Taiwan University

#### Adjunct Assistant Professor

Yun-Yao Chiu	Ph.D., National Taiwan University
Chih-Yi Chang	Ph.D., National Taiwan University
Chang-Wei Chai	Ph.D., National Taiwan University

## FACILITIES

The Department of Mechanical Engineering is located on campus in College of Engineering Building, Mechanical Engineering Building, Chih-Hung Hall, ME Machine Shop, and Thermal Mechanics Laboratory. These facilities provide classrooms, meeting rooms, and more than 60 various auxiliary teaching and research laboratories.

Laboratories in the areas of heat transfer, fluid mechanics, thermal mechanics, thermo-fluid science, system control, solid mechanics, vibration, mechanism, CAD, measurement, MEMS, and so on, and the NTU Machine shop provide the mechanical-engineering related experimental courses for undergraduates. The department has established an excellent research environment in the fields of combustion technologies, two-phase flows, computational fluid dynamics, granular bed filters, boiler technologies, wind tunnel testing, calibration, low-temp refrigeration, solar energy, solar cars, new energies, fuel cells, multi-powered cars, wind power, fracture & fatigue, metal forming, plastic processing, mechanical materials, surface treatment, casting, machining, tribology, EDM, automation of plants, precision measuring and machining, equipments of semiconductor manufacturing, machine design, CAD/CAM, precision control, system simulation, robotics, intelligent cars, mechanical-electro integration, MEMS, RFID, nanotechnologies, nanotechnology measurement, flexible electronics, biomechanics, bio-chips, assistive devices for biomedical purposes, clean room technologies, etc. Additionally, the computer center provides the staffs and students with an open environment for the teaching and use of advanced computer software and hardware.

## COURSES

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### Undergraduate Programs

To graduate, students must complete more than 140 credit hours, including 30 credits for the common and general courses, 69 credits for required professional courses, and 41 credits for selective courses. Physical courses and service courses are not accredited. Courses for the first two years are mainly required and emphasize the knowledge of fundamental science. Courses for the last two years are mostly selective and professional.

### Graduate Programs

The teaching and research at the graduate institute are divided into five fields, the solid mechanics, the mechanical design, the manufacturing, the thermal-fluid science, and the system control fields. Students in the MS programs must take 24 credits of courses, besides a MS thesis. A MS degree will not be granted until the thesis is defended orally. Students in the Ph.D. programs, on the other hand, must be enrolled for at least two years, take 18 credits of courses, finish a Ph.D. thesis, publish two journal papers (at least one of them must be published in a SCI journal). Passing the Ph.D. qualifying exam and successfully defending the thesis are required for a grant of a Philosophy degree.

## ACADEMIC ACTIVITIES

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1. The department has acquired the IEET engineering accreditation. (Expiration in 2011)
2. "The Symposium of Precision Machining and Grinding Technology" (2008/11/7)
3. "2008 New Energy Technology Conference" (2008/12/5)
4. "2009 Asia-Pacific Conference on Optics Manufacture" (2009/2/11-2/14)
5. "2009 ASME Asia-Pacific Engineering Education Congress" (2009/4/9-4/11)
6. "2009 Seventh Asia-Pacific Conference on Combustion" (2009/5/24-5/27)
7. The department helped to hold "The Australia Taiwan Strategic Workshop." (2009/5/18-5/22)
8. The department helped to hold "IUTAM Symposium on Recent Advances of Acoustic Waves in Solids." (2009/5/25-5/28)
9. C. Y. Lee, supervised by Prof. J. T. Yang, won the first prize of "2008 Thesis Award" for the paper "Lift-Force Generation Mechanism of Flapping Flight of a Butterfly." (2008/11/28)
10. Prof. J. T. Yang awarded "The Outstanding Research in Thermal Sciences and Fluid Mechanics," provided by the Aeronautical and Astronautical Society of the Republic of China.(2008/12/6)
11. H. A. Yang, supervised by Prof. H. K. Ma, awarded "Outstanding Paper Award of the 18th National Conference on Combustion Science and Technology."(2008)
12. S. H. Huang et al., supervised by Prof. H. K. Ma, won the first Prize of 2008 TIC100 Innovation Competition.(2008)
13. Prof. H. C. Yang participated in the 16th annual International Air Safety Seminar and keynoted the convention of "Safety Research for Safer".(2008/11/4)
14. Prof. S. K. Wu awarded "The Thesis Award," provided by the Taiwan Society for Metal Heat Treatment.(2008)
15. Prof. P. H. Chen named "Fellow of American Society of Mechanical Engineers." (2009/3/1)
16. Prof. H. P. Huang awarded "Merit NSC Research Fellow Award," provided by National Science Council. (2009/3/27)
17. Prof. J. H. Cheng awarded "Prof. Y. P. Shih Engineering Thesis Award." (2009/5/11)
18. Prof. Y. S. Liao awarded "The 3rd CMO Award."(2009/6/17)
19. C. C. Lin, Y. A. Chen, supervised by Prof. H. P. Huang, won the gold award of "2008 International Robot Software Competition," provided by Korea University and IEEE. (2008/8/29~8/30)
20. P. T. Kuo, supervised by H. T. Yang, awarded "National Filial Piety." (2008/10/25)
21. W. C. Hsu awarded "Scholarship of Outstanding Engineer." (2009/5/11)
22. H. J. Chen, C. H. Chien, K. H. Wang, C. H. Cheng, Y. M. Chou acquired certificate of "Mechanical Engineer-Fundamental Level." (2009/6/16)

## CAREERS AND FRUTHER STUDIES

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### ■ Professional abilities

- (1) Nanometer technology and micro-electro-mechanical systems (MEMS), such as Micro-sensors, nano-actuators, etc.
- (2) Thermal engineering as motivity factory, engine, air conditioner, etc.
- (3) Fluid mechanics as fluid mechanism, vacuum technology, aeronautical engineering, etc.
- (4) Solid mechanics as mechanical vibration, mechanical structure, etc.
- (5) Mechanical design as computer assisted design, mechanism design, etc.
- (6) Manufacturing as cutting, casting, plastic manufacture, etc.
- (7) System control engineering as robot electro-mechanical systems.

### ■ Further studies

- (1) Graduate Institute of Mechanical Engineering
- (2) Graduate Institute of Applied Mechanics
- (3) Graduate Institute of Aerospace Engineering
- (4) Graduate Institute of Materials Science and Engineering
- (5) Graduate Institute of Engineering Science and Ocean Engineering
- (6) Graduate Institute of Electrical Engineering
- (7) Graduate Institute of Environment Engineering
- (8) Graduate Institute of Industrial Engineering

### ■ Career options

- (1) Research and design engineer in emerging

technology industry and high technology

- (2) Government institutions, such as Industrial Development Bureau, Environmental Protection Bureau, Ministry of Transports and Communications, Ministry of Economic Affairs, Ministry of National Defense, etc.
- (3) Teaching in the Department of Mechanical Engineering and related departments.
- (4) Professional research institutions, such as Industrial Technology Research Institute, Chung-Shan Institute of Science and Technology, Academia Sinica, Committee for Aviation and Space Industry Development, etc.

## CONTACT INFORMATION

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Email:[meoffice@ntu.edu.tw](mailto:meoffice@ntu.edu.tw)

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# 3. DEPARTMENT OF CHEMICAL ENGINEERING

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## INTRODUCTION

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The Department of Chemical Engineering was established in 1941 as the Department of Applied Chemistry. In 1945, it was reorganized and changed to its present status as the Department of Chemical Engineering under the College of Engineering. The department moved to its present building in 1963, which occupies a total area of 5,000 square meters. An undergraduate program leading to a Bachelor of Science degree has been offered since the establishment of the department. The Master of Science program was initiated in 1964 and the Doctoral program in 1970. The current enrollment in this department is 460 undergraduate students and 270 graduate students. Our programs emphasize the application of chemical engineering principles to major problems in chemical engineering as it is practiced, especially in chemical process industries. Examples of current research activities conducted by our faculty include: dynamic modeling and analysis of chemical processes, colloidal and interfacial engineering, polymer composites, prediction of thermodynamic properties, membrane technology, biomaterials, electro-chemical engineering, catalysis, gas-liquid stirred reactors, boiling heat transfer, catalytic oxidation of hydrocarbon, powder technology, crystallization, process system engineering, environmental technology, biochemical

and biomedical engineering, and electronic materials processing.

## FACULTY

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Full-time: 34

Part-time: 4

Ph.D. Degree: 38

### Chair/ Professor

Li-Jen Chen                      Ph.D. Ch.E. Rice University

### Full-time

#### Professor

Cheng-Liang Chen              Dr.S. Ch.E. NTU.

Wen-Chang Chen                Ph.D. Ch.E. University of Rochester

Yan-Ping Chen                    Ph.D. Ch.E. Rice University

Wen-Yen Chiu                    Dr.S. Ch.E. NTU.

Kuo-Chuan Ho                    Ph.D. Ch.E. University of Rochester

Hsyue-Jen Hsieh                Ph.D. Ch.E. Pennsylvania State University

Kuo-Huang Hsieh                Dr. Eng. University of Detroit

Jyh-Ping Hsu                    Ph.D. Ch.E. Kansas State University

Hsiao-Ping Huang                Dr.S. Ch.E. NTU.



Huan-Jang Keh	Ph.D. Ch.E. Carnegie Mellon University
Chung-Wen Lan	Ph.D. Mater.Sci. University of Wisconsin-Madison
Duu-Jong Lee	Dr.S. Ch.E. NTU.
Keh-Chyang Lee	Ph.D. Ch.E. University of Washington
Lii-Ping Leu	Ph.D. Ch.E. Oregon State University
Hwai-Shen Liu	Ph.D. Ch.E. University of Tennessee
Chung-Hsin Lu	Dr. Inorg. Mater. Tokyo Institute of Technology
Yu-Jane Sheng	Ph.D. Ch.E. University of Delaware
Shin-Min Shih	Ph.D. Ch.E. University of Texas -Austin
Clifford Yi-Der Tai	Ph.D. Ch.E. North Carolina State University
Wei-Bor Tsai	Ph.D. Bio.E. University of Washington
Ben-Zu Wan	Ph.D. Ch.E. Texas A & M University
Da-Ming Wang	Ph.D. Ch.E. Pennsylvania State University
Chi-Sheng Wu	Ph.D. Ch.E. University of Pittsburgh
Nae-Lih Wu	Ph.D. Ch.E. Pennsylvania State University
Shi-Chern Yen	Ph.D. Ch.E. University of Wisconsin-Madison

**Associate Professor**

Chi-An Dai	Ph.D. Mater. Sci. Cornell University
Sheng-Shih Wang	Ph.D. Ch.E. Texas A&M University
Shiang-Tai Lin	Ph.D. Mater. Sci. Cornell University

**Assistant Professor**

Cheng-Che Hsu	Ph.D., Ch.E University of California at Berkeley
Chih-Chen Hsieh	Ph.D. Ch.E. University of Michigan
Chia-Wen Wu	Ph.D. M.S.E The University of Tokyo
Ying-Chih Liao	Ph.D., Ch.E Purdue University
Jeffrey D. Ward	Ph.D., Ch.E University of California, Santa Barbara

**Part-time****Professor**

Chia-Soon Ku	Ph.D. Ch.E. Pennsylvania State University
Wei-Ming Lu	Ph . D.Ch.E University of Houston
Min-Hon Rei	Ph.D. Chem. Purdue University
Shih-Yow Huang	Ph.D. Ch.E. Tokyo University

## FACILITIES

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All Department laboratories are equipped with specialized instrumentation in various research fields. In addition, the Department consolidates the relevant equipment in two centralized laboratories: the Instrumental Analysis Laboratory and the Particulate Technology Laboratory. These two laboratories provide services to all of our faculty members and students for their research and/or teaching needs. For the purpose of developing education and research of particulate techniques, the Particulate Technology Laboratory also offers related courses every semester, and symposia and seminars are hosted, some regularly and some occasionally. Besides, the Particulate Technology Laboratory accepts the participation of industry so as to link the needs of industry with its projects and to receive support from concerned enterprises.

### Particulate Technology Laboratory

This laboratory combines important equipment for particulate analysis, which includes:

Microscope, Particle Size Analyzer, Spectrophotometer, Pycnometer, Zeta-Potential Meter, Powder Bed Tester, Porosimeter, Dilatometer, Sieve, Mill, Mixer.

### Instrumental Analysis Laboratory

This laboratory consolidates equipment for thermal analysis, chemical analysis, material characterization and analysis, and fluid properties analysis.

Thermal Analysis: Thermogravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), TD-DTA-DSC-Mass Spectroscopy, Dynamic Mechanical Analysis (DMA); Chemical Analysis: UV-Visible Spectrophotometer, Atomic Analyzer (AA), Gas Chromatography (GC), High-Performance Liquid Chromatography (HPLC), Gel Permeation Chromatography (GPC), Ion Chromatography (IC), Ultra Centrifuge; Materials Characterization and Analysis: Scanning Electron Microscopy (SEM), Energy-Dispersive X-Ray Spectroscopy (EDS), Polarized Optical Microscopy, Optical Microscopy, X-Ray Diffractometry (XRD), X-Ray Fluorescence Film-Thickness Analyzer, Ellipsometer, X-ray Photoelectron Spectroscopy (XPS), Atomic Force Microscopy (AFM); Fluid Properties Analysis: Viscometer, Inductively Coupled Plasma Optical Emission Spectrometry (ICP), and Rheometer.

Furthermore, various softwares, including Aspen Plus, ChemCad, Fluent, and FIDAP are used in teaching and research.

## COURSES

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The Department has long been engaged, not only in developing key chemical engineering technologies to create more efficient and environmentally friendly processes, but also in promoting and exploring research activities on new frontiers. Cooperative efforts are facilitated by the presence of three interdisciplinary laboratories within the Department. These include the Particulate Technology Laboratory and the Environmental Technology and Pollution Control Laboratory. There is also the Research Center for Petrochemical Industry. Our research combining biotechnology and biochemical engineering and the development of new polymer materials and processing techniques offer good examples. Collaboration is also achieved by recruiting talented faculty and through interdisciplinary cooperation in a number of projects. The research interests covered by our faculty members have branched into chemistry, biotechnology, food science, materials science, environmental engineering, medical engineering, electronic materials, etc.

Specialized laboratories supplement much general apparatus for undergraduate laboratory courses as well as graduate research. Some of them are: Computer Room, Unit Operation Laboratory, Instrumental Analysis Laboratory, Particulate Technology Laboratory, Biochemical Engineering Laboratory, Bioprocessing Engineering Laboratory, Biomedical Engineering Laboratory,

Biomaterials Lab, Process Systems Engineering Laboratory, Chemical Process Laboratory, Catalysis and Reaction Engineering Laboratory, Laboratory, Crystallization Engineering Laboratory, Dispersed Phase Laboratory, Two-Phase Flow Laboratory, Colloid and Interface Laboratory, Heat Transfer Laboratory, Interfacial Phenomena Laboratory, Molecular Simulation Laboratory, Polymeric Fluid Mechanics Laboratory, Energy Materials Laboratory, Electrochemical Engineering Laboratory, Electronic and Electro-Optical Ceramics Laboratory, Electro-Optical Polymer Laboratory, Electro-Optical Materials Laboratory, Polymer Materials Laboratory, Membrane Separation Laboratory, Clean Technology Laboratory, Crystal Growth Laboratory, Thermodynamics and Supercritical Technology Laboratory, Polymer Science and Engineering Laboratory, Nano Biotech Laboratory, Plasma Engineering Laboratory Computational, Molecular Engineering Laboratory, Biopolymer Dynamics and Micro/Nano-Fluidics Laboratory, Mesoporous Materials Laboratory.

### Undergraduate Courses

Engineering Graphics(2), Calculus (General Mathematics) (A)(I)(II)(8), General Chemistry (A)(I)(II)(6), General Chemistry Lab (I)(II)(2), General Physics (A)(I)(II)(6), General Physical Lab.(I)(II)(2), Computer Programming(3) MATLAB(3), Mass and Energy Balances(A)(3), Mechanics of Materials(3), Engineering Mathematics (I)(II)(6), Organic Chemistry (B)(I)(II)(6), Organic Chemistry Lab. (B)(I)(II)(2), Physical

Chemistry (I)(II)(6), Analytical Chemistry (C)(2), Analytical Chemistry Lab. (C)(1), Transport Phenomena and Unit Operations(I)(II)(III)(9), Electrical Engineering (3), Physical Chemistry Laboratory (I)(II)(2), Chemical Engineering Thermodynamics(3), Chemical Reaction Engineering(3), Chemical Engineering Laboratory (I)(II)(2), Process Control(3), Process Design (3), Chemical Process Industries(2), Special Projects (B.S.) (B)(2), Special Projects (B.S.)(E)(2), Special Projects (B.S.)(C)(1), Literature Survey(2)

### Graduate Programs

Advanced Fluid Mechanics(3), Advanced Heat and Mass Transfer(3), Advanced Chemical Engineering Kinetics(3), Advanced Chemical Engineering Thermodynamics(3), Advanced Chemical Engineering Mathematics(3)

The department offers M.S. and Doctorate programs for students with a B.S. degree in chemical engineering or related fields. Candidates for the M.S. degree must complete a minimum of 34 credits including six credits for thesis work and two credits for graduate seminars. One additional requirement is an oral examination on the thesis by a committee organized by the department faculty.

The department offers graduate courses in many fields: Advanced biochemical engineering, Advanced chemical engineering kinetics, Advanced chemical engineering thermodynamics, Advanced theory of polymers, Advanced transport phenomena, Computer process control and optimization, Electrochemical engineering, Gas-solid reactions, Topics in particulate technology, Semiconductor processing. Students who pass the entrance and qualifying examinations may enter the doctoral program. A minimum of 15 credits of course work beyond a Master's degree, including at least 9 credits in core courses of chemical engineering, is required. A dissertation that makes a contribution to chemical engineering science and an oral examination are also required for the completion of the Doctor's degree.



## ACADEMIC ACTIVITIES

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The Department has been actively involved in promoting interactions between researchers from the college and industry, as well as in sponsoring or cosponsoring symposia on a range of subjects related to Chemical Engineering, including Symposium on Transport Phenomena (annually), Symposium on Computer Process Control (annually), Symposium on Nanomaterials and Electro-Optical Component Application, Symposium on Liquid Clarification Technology, Membrane Separation Workshop, Symposium on Sludge Management, Workshop on Chitosan, Workshop on Optical Communication Components and Materials, Workshop on Waterborne Resin, Workshop on Powder Coating Resin, Electrochemistry Workshop, Symposium on Economical Analysis of Chemical Engineering Processes, Symposium on LCD materials/ Technology Development, Workshop on Ferroelectric memory, Crystallization Workshop, just to name a few.

## CAREERS AND FURTHER STUDIES

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The Chemical Engineering Department has grown in strength and vitality and now is recognized as the best teaching and research institute in the field in Taiwan. With this excellent tradition, we are prepared for new developments in chemical engineering in the 21st century. Besides the basic fields of chemical engineering, we also offer teaching and research on New Material Science, Polymer Science and Engineering, Biotechnology, Pollution Prevention, Bioengineering and Biomedical Engineering and Specialty Chemicals. Students are trained in integrated process analysis and design, together with the key concepts of industrial safety and environmental protection. Maintaining our devotion to teaching and research, we anticipate the continued progress of this department.

## CONTACT INFORMATION

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Established in: 1941

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E-mail : [chemeng@ntu.edu.tw](mailto:chemeng@ntu.edu.tw)

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# 4. DEPARTMENT OF ENGINEERING SCIENCE AND OCEAN ENGINEERING

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## INTRODUCTION

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The Department of Engineering Science and Ocean Engineering was established at 1973(Ship Model Basin 1968, Institute of Naval Architecture 1973, Department of Naval Architecture 1976, Department of Naval Architecture and Ocean Engineering 1992, Department of Engineering Science and Ocean Engineering 2002). The alumni of the department have significant contributions in the industries of ship building, Ocean engineering, Information and Opto-mechtronics and also in academic. The educational objectives of the department are to offer students training in the fundamental principles of engineering analysis and mathematical techniques and interdisciplinary training of Naval Architecture and Ocean Engineering, Information and Scientific Computation, Applied Mechanics and Opto-mechtronics. On the research aspect, the research groups of the department focus in the fields of bio-photonics, intelligent wireless sensor network, smart structure, piezoelectric switcing power supplies, opto-mechtronics systems, offshore wind farm, ocean energy, underwater vehicle, shipbuilding, ocean engineering, composite material, underwater acoustics, vibration and application ultrasonic, applied acoustics, compuation and simulation of

health and healing, advanced fluid power control, multimedia network, bio-informatics, nano-photonics and computer aided design. The department publishes around 50 journal papers cited by Science Citation Index and applies for 3 to 5 patents every year. There are already 2 Distinct Researchers with special appointment from National Science Council, 6 professors with NSC outstanding Research Award and 2 holders of Distinct Professorship.



## FACULTY

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Full-time: 26

Part-time: 8

Ph.D.: 31

M.S.: 3

### Chair/ Professor

Chia-Chi Sung Ph.D., Pennsylvania State University, U.S.A.

### Full-time

#### Professor

Ya-Jung Lee Ph.D., University of Tokyo, Japan.

Ming-Chung Lin Ph.D., University of Tokyo, Japan.

Forn-Chen Chiu Ph.D., University of Tokyo, Japan.

Chen-Far Hung Ph.D., University of Hannover, Germany.

Jen-Shiang Kouh Ph.D., University of Hannover, Germany.

Chuan-Cheung Tse M.S., Memorial University of Newfoundland, Canada

Wen-Hann Sheu Ph.D., Purdue University, U.S.A.

Huei-Jeng Lin Ph.D., NTU, R.O.C.

Chih-Kung Lee Ph.D., University of Cornell, U.S.A.

Kuo-Tsai Chen Ph.D., NTU, R.O.C.

Jing-Fa Tsai Ph.D., NTU, R.O.C.

Te-Pu Chiang Ph.D., NTU, R.O.C.

Wei-Shien Hwang Ph.D., University of Iowa, U.S.A.

Wen-Jeng Hsueh Ph.D., NTU, R.O.C.

Chao-Nan Wang Ph.D., NTU, R.O.C.

Chi-Fang Chen Ph.D., Massachusetts Institute of Technology, U.S.A.

Chao-Lung Ting Ph.D., University of Michigan, U.S.A.

Jen-Hwa Guo Ph.D., University of Minnesota, U.S.A.

#### Associate professor

Wen-Jiunn Ko Ph.D., NTU, R.O.C.

Mao-Hsiung Chiang Ph.D., RWTH Aachen, Germany.

Ray-I Chang Ph.D., National Chiao Tung University, R.O.C.

#### Assistant professor

Wen-Jong Wu Ph.D., NTU, R.O.C.

Chien-Kang Huang Ph.D., NTU, R.O.C.

Jia-Han Li Ph.D., Purdue University, U.S.A.

Jau-Horng Chen Ph.D., Georgia Institute of Technology, U.S.A.

#### Emeritus Professor

Yih-Nan Chen Ph.D., University of Tokyo, Japan.

Chun-Tsung Wang Ph.D., University of Illinois, U.S.A.

Jeng-Lih Hwang M.S., NTU, R.O.C.

Yung-Hsiang Chen Ph.D., UC Berkeley, U.S.A.

### Part-time

#### Professor

Robert R. Hwang Ph.D., University of Iowa, U.S.A.



Yih-Nan Chen	Ph.D., University of Tokyo, Japan.
Jeng-Lih Hwang	M.S., NTU, R.O.C.
Yung-Hsiang Chen	Ph.D., UC Berkeley, U.S.A.
Sheng-Wen Cheng	Ph.D., University of Tokyo, Japan.
Chin-Hwa Kong	Ph.D., University of Michi- gan,U.S.A.

**Associate professor**

Tsong-Neng Wu	Ph.D., NTU, R.O.C.
Chung-Sheng Chen	M.S., NTU, R.O.C.

## FACILITIES

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The Department occupies a main two-floor building and several laboratories nearby. The total floor space is approximately 7200 square meters, including one computer center, 22 research laboratories, and 4 experimental workshops. The computer center supports the computer network of department and provides one computer room for the undergraduate students.

### The Department has 25 research laboratories:

Nano-BioMEMS Lab was established as a common lab for grand challenge nanotechnology, biomedical, and MEMS integrated large-scale research projects. The Nano-BioMEMS lab contains 4 major parts, (1) Grand challenge: the common lab for large-scale research projects. (2) Core facility: These research projects help to build common research facilities and also join the NTU virtual instrument center to share expensive research equipment. (3) Research backbone, the supporting infrastructure, a common server office and a mobile office for researchers from other institutes. (4) Interface to outside world: The Opto-Mechronic System Lab focuses on interdisciplinary research topics in biomedical, nanotechnology fields, based on the basic disciplines of electronics, optics, computer science, and mechanics. MEMS Lab is concerned with design and manufacture technology for micro or nano scale of optical, electronic, mechanical and chem-

ical sensors and actuators. Electro-Optical and Communication Lab is devoted to component and system design for optics and communication. Nanophotonics and Nanoelectronics Laboratory focuses on the scientific computing, physical modeling, and experiment measurement of the nanophotonic and nanoelectronic devices. The main focus of High Efficiency Circuit and System Lab is efficient power conversion integrated circuits wireless and handheld applications.

Computer-aided Design Lab, Computational Fluid Mechanics Lab and CAE/CIM Lab are focused on computer-aided design and manufacturing. Scientific Computing and Cardiovascular Simulation Lab and Computational Mechanics and Scientific Visualization Lab emphasize research on scientific computing and cardiovascular simulation. Information and Multimedia Laboratory focuses on internet and multimedia applications and bio informatics.

Facilities used for conducting research in structure and acoustic engineering are housed in Vibration and Ultrasound Lab, Acoustics Lab, Structure Lab, Composite Material Lab and Applied Acoustic Lab. Industrial Automation Lab, Real-time System Research and Implementation Lab provide advanced research and education in manufacturing automation and design of embedded systems.

Advanced Fluid Power Control Lab offers facilities for the design and analysis of hydraulic

components and hydraulic systems. Ship Towing Tank, Cavitation Lab, Motion and Control Lab, Ship Model and Propeller Workshop support researches in naval architecture. Several Labs in the Department are devoted to ocean engineering research. One is the Ocean Engineering Lab dedicated to coastal engineering research and education. Research efforts of Underwater Acoustics Lab and Underwater Vehicle Lab are concerned with the development and application of underwater technology.

Basic Fluid Mechanics Lab, and Basic Engineering Lab, Information & Internet Teaching Lab and Electronics & Mechatronic Lab were established to provide education facilities for the undergraduate students.

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## COURSES

### Undergraduate Programs (I)

Calculus I, II (8), General Physics (lab. Included)(8), General Chemistry (lab. Included)(4), Introduction to Engineering Science and Ocean Engineering(0), Engineering Graphics(2), Introduction to Computer(3), Computer Programming(3), Statics (2)

Engineering Mathematics I, II (6), Fluid Mechanics (3), Thermodynamics (3), Electrical Engineering (3), Material Science (3), Basic Engineering Experiments (2)

## Undergraduate Programs (II)

### OPTO-MECHTRONICS

Logic Circuit Design(3), Electronics(3), Numerical Methods(3), Electricity and Magnetism(3), Signals and Systems(3), Automatic Control(3), Fundamental of Optics (3), Opto-Mechtronics Laboratory(2), Electronics Laboratory(1)

### INFORMATION & COMPUTAION SCIENCE

Discrete Mathematics(3),Data Structures (3), Numerical Methods (3), Linear Algebra (3), Object Oriented Programming Language (3), Finite Difference Method (3), Computer Graphics (3), Logic Circuit Design(3)

### APPLIED MECHANICS

Mechanics of Materials (3), Numerical Methods (3), Intermediate Fluid Mechanics (3), Dynamics (3), Heat and Mass Transfer (3), Advanced Strength of Material (3), Theory of Vibration (3), Mechanics Laboratory (3)

### NAVAL ARCHITECTURE & OCEAN ENGINEERING

Mechanics of Materials (3), Numerical Methods (3), Dynamics (3), Theory of Structures (3)

Physical Oceanography (3), Buoyancy and Stability (3), System Dynamics (3), Mechanics Laboratory (3)

## Graduate Programs

The Master degree usually takes 2 to 4 years. In addition to writing the Master's thesis, the graduate student must take at least 24 credits. Research in the following areas are available: bio-photonics, nano-photonics , intelligent wireless sensor network, smart structure, piezoelectric switching power supplies, opto-mechtronics systems, optoelectronics, nano-technology, biomedical engineering, offshore wind farm, ocean energy, underwater vehicle, shipbuilding, ocean engineering, composite material, underwater acoustics, vibration and ultrasound, computation and simulation of health and healing, advanced fluid power control, ship propulsion, ship motion, welding mechanics, computer aided design, acoustics and noise control, underwater technology, software engineering, scientific computing, internet application, multimedia network, bio-informatics, computer animation and virtual reality.

The doctoral program takes 2 to 7 years. After passing the qualifying examination, the doctoral student must complete at least 18 credits (excluding Doctoral thesis credits), two published journal papers(Includes one SCI paper), and successfully defend his/her thesis to earn a Ph.D. degree in Engineering Science and Ocean Engineering.

## ACADEMIC ACTIVITIES

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Weekly seminars are held on every Friday afternoon to ensure that students have ample exposure to a variety of current research topics and events through invited speakers from both university and industry. The Department also co-sponsors many domestic or international symposiums and workshops throughout the year.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

Electro-Mechanics, Optics, Nano Technology, Optoelectronics, biomedical technology, Information Science, Computer Science, Applied Mechanics, Ship Building and Ocean Technology.

### ■ Further studies

Institution of Electrical Engineering, Electro-Optics Engineering, Electronic Engineering, Electromagnetics, Computer Science and Information Engineering, Applied Mechanics, Ocean Engineering, Material Science, Material Science, and Civil Engineering.

### ■ Career options

(1) Research and Development Engineers in Electro-Mechanics, Optics, Information Science, Computer Science, Precision Machining, Aeronautics, Automobile Vehicle, Ship Design, and Civil Engineering.

(2) Researcher of National Applied Research Laboratories, Industrial Technology Research Institute, Chung-Shan Institute of Science and Technology and research institutes of Ministry of Economics Affairs

(3) Education.

## CONTACT INFORMATION

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Website: <http://www.esoe.ntu.edu.tw>

E-Mail: [sheulf@ntu.edu.tw](mailto:sheulf@ntu.edu.tw)

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# 5. DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

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## INTRODUCTION

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In Taiwan, the first teaching and research on “Materials and Science and Engineering (MSE)” were launched in the 1950s at the College of Engineering, National Taiwan University (NTU). The progenitor was our second Chancellor, Professor Tze-Hong Loh, who from 1945 to 1975 gave lecture courses on “Crystal Structure and Defects” and devoted his life to research on engineering materials. In 1972, the first material transmission electron microscope in Taiwan was installed by Professor Loh through a special grant supported by the International Foundation, United States. The foundation of MSE at NTU was thereby established.

In August 1982, the Institute of MSE was established, offering a Master’s program. The Ph.D. program was initiated in 1987. However, teaching and research on “MSE” have been conducted for more than half a century at NTU. Esteemed senior professors inspire our alumni to devote their efforts to the field of MSE, so many alumni have achieved distinguished accomplishments. Their contributions in Taiwan and abroad have earned respect and recognition.

The Bachelor’s program was started in 2001, and since then, the department has attracted the most talented senior high school students to enroll as undergraduates. For example, in the 2008 academic year, we recruited new undergraduates ranked in the top 1.2% from the thirty thousand candidates for the Science-Engineering Category in the nationwide joint university admission test. The department is responsible for maintaining a demanding and strict teaching program to train the most highly valued materials and engineering students in the nation. In undergraduate teaching, the emphasis is always on the underlying principles that are applicable to the whole range of engineering materials: metals, ceramics, polymers, and electronic materials. The curriculum is meticulously planned and arranged to enable prospective graduates to provide high performances in various fields related to materials.

The rise of high-technology industries has brought about economic prosperity in Taiwan. However, we should bear in mind that MSE technologies have a great influence on the development of high-technology industries. That is to say, the top problems in industry are always related to knowledge of materials. Although there have been great advances in technology, we are encountering the

most serious challenge in the form of energy sources for the 21st century. Vibrant innovation in energy-saving materials is definitely our first concern. Joining the MSE team at NTU will allow you to fulfill your aspirations.

## FACULTY

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Full-time:23

Adjunct:4

Ph.D.:27

### Chari/Professor

Jer-Ren Yang Ph.D., Univ., Univ. of Cambridge

### Full-Time

#### Professor

Chun Chen Ph.D., Rensselaer Poly. Institute

Yuan-Haun Lee Ph.D., Kyoto Univ.

Tung-Han Chuang Ph.D., Stuttgart Univ.

Po-Cheng Kuo Ph.D., NCKU

Shuang-Shii Lian Dr. Ing., Tech. Univ. Berlin

Kuen-Shyang Hwang Ph.D., Rensselaer Poly. Institute

King-Fu Lin Ph.D., Polytechnic Univ. of New York

Wen-Cheng Wei Ph.D., Case Western Reserve Univ.

Wei-Hsing Tuan Ph.D., Leeds Univ.

Wei-Fan Lin Ph.D., Univ. of Massachusetts

Wen-Bin Liao Ph.D., Univ. of Utah

Hsin-Chih Lin Ph.D., NTU

Cheng-Heng Kao Ph.D., Univ. of Wisconsin, Madis

Chao-Sung Lin Ph.D., Univ. of Northwestern

Ren-Kae Shiue Ph.D., MIT

Chun-Wei Chen Ph.D., Univ., of Cambridge

#### Associal Professor

Hsuen-Li Chen Ph.D., NTU

Miin-Jang Chen Ph.D., NTU

Tzong-Lin Sheih Ph.D., Univ., of Cambridge

#### Assistant Professor

Feng-Yu Tsai Ph.D., Univ. of Rochester

Chi-Yang Chao Ph.D., Cornell Univ.

Chin-Lung Kuo Ph.D., Cornell Univ.

### Adjunct

#### Professor

Shyi-Kaan Wu Ph.D., Univ. of Illinois

Wen-Yen Chiu Ph.D., NTU

Cheng-Hsuan Che Ph.D., Cornell Univ.

#### Assistant Professor

Jing-Jong Shyue Ph.D., Case Western Reserve Univ..

#### Professor Emeritu

Chen-Hsien Hwang BS., NTU

Shun-Tai Chang Ph.D., Univ. of Connecticut

Chun-Hao Koo Ph.D., Univ. of California, Berkeley

Wen-Hsiung Wang M.S., National Taiwan Univ.

## FACILITIES

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### > Electron Microscope Lab

SEM XL-30, SEM LEO1530, TEM, STEM, EPMA, FEG-TEM

### > Material Lab

MTS, Impact Tester, Hardness Tester

### > Thermal Analysis Lab

Thermal Analysis Facilities : - TGA -DSC -DTAD -DMA

Carbon/Sulfur Determinator, Oxygen/Nitrogen Determinator

### > Metallographic Lab

Microscopes-Optical microscope, Stereo microscope, Multi-function microscope, Measurable microscope, Cutting Machine, Grinding, Polishing Machine, Mounting Press Machine

### > Electronic Packaging Lab

Ultra high vacuum sputtering system, High vacuum heat treatment furnace

Vibrating sample magnetometer, High frequency heating furnace

### > Smart Memory Materials Lab

Ferroelectric analyzer, Precision diamond saw, Environment chamber

Strain amplifier, high temperature sintering oven

### > Structural Intermetallics Lab

Differential Scanning Calorimetry (DSC), DC/RF Sputtering Equipment

Dynamic Mechanical Analyzer (DMA),  $\alpha$ -stepper, Optical Spectrometer

Infrared Furnace, Vacuum Arc Remelter (VAR), Optical Microscopy

High Vacuum Furnace, Heating Furnace, Diamond Cutter, Wear Tester

### > Powder Metallurgy Lab

40 ton ARBURG-injection molding machine, Horiba carbon/sulfur analyzer, 100 ton press, Cyclicrometer, Rattler tester, Four point bend tester Vacuum furnace, Debinding furnace, Sintering furnace, Fisher subsieve sizer

### > Surface Modification Lab

Potentiostat/Galvanostat, Function/Arbitrary Waveform Generator

NF electronic Power Amplifier TA250 W/ V0-40 Oscillator

Electrochemical Impedance Spectroscopy (Frequency Response Detector)

Oxygen/Conductivity/pH Meter, Rotating Disk Electrode

Data Acquisition(DAQ) Hardware

### > Dynamic Test Lab

Rofin-Sinar 850, 5KW CO2 LASER

### > Semiconductor Optoelectronic Materials LAB

Time-of-flight mobility measurement system

Time-resolved photoluminescence spectroscopy

### > Nano-Optoelectronic Polymer Lab

1000W Xenon Arc Lamp Light Source, Vacuum Deposition Equipment

Vacuum Evaporator, Automatic Atmosphere Chamber

### > Frontier Materials Lab

Atomic Force Microscope, Scanning Near-Field Optical Microscopy

Photoluminescence spectroscopy, UV-Vis absorp-



tion spectroscopy

> **Nanoelectronic And Nanophotonic Materials Lab**

Atomic layer deposition

Low temperature photoluminescence spectroscopy

> **Vacuum Melting of Alloys Lab**

Vacuum introduction furnace with water-cooled copper-crucible

Plasma remelting, Electroslag remelting,

Rotating electrodes, Vacuum arc melting

> **High-Temperature Ceramic Lab**

New-type equipment-fluorine gas generator

High frequency introduction furnace

> **Optoelectronic Thin-film Processing Lab**

Atomic Layer Deposition systems

Plasma Enhanced Atomic Layer Deposition systems

Glovebox

> **Structure and Properties of Polymer Lab**

Differential Scanning Calorimeter

Dielectric analyzer

> **Nano Optoelectronics Lab**

Constant temperature & humidity Incubator-Balance Control

finite-difference time domains (FDTD)

High temperature furnace

UV-visible spectrometer

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## COURSES

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The Department of Materials Science and Engineering has five research divisions: metallic materials, polymeric materials, ceramic materials, electronic materials, and processing.

### Metallic Materials

The purpose of this division is to help the students develop expertise in metallic science and engineering. The students learn about the relationships between the structure and the development processes of metals as well as about the kinds of structural changes that can happen during the lifetime of a metal. With this knowledge, they investigate ways to improve the characteristics of existing materials and to develop new materials. Recently, the focus of research and development of metallic materials has changed from traditional materials to advanced materials in order to deal with the worldwide energy problem. The R&D of super high strength metals and functional metals is an important task.

### Polymeric Materials

The purpose of this division is to train the students in the research skills relevant to polymeric materials. The students are taught how to research and develop advanced polymeric materials and how to study the relationships between molecular design, synthesis, working abilities, physical conformation, the characteristics of materials, and industrial applications. Currently, our research is focused on

functional polymers (such as electronic, optoelectronic and biomaterials) and high performance polymers (such as nanocomposites and flame retardant materials).

### Ceramic Materials

The purpose of this division is to teach research skills in the area of advanced ceramics. The students learn the fundamentals of materials science and study the principles and practical matters involved in the processes used in the development of fine ceramics, conduct analyses of microstructures, and test materials to determine their characteristics. They also conduct extensive research into the processes of fine ceramics, structural ceramics, bio-ceramics, and energy source materials.

### Electronic Materials

The purpose of this division is to train qualified researchers to develop future electronic, optoelectronic, and magnetic materials. The research focuses on advanced materials and processes of developing semiconductors, optoelectronic materials and devices, advanced electronic packages, optical thin film materials and processes, advanced solar cell materials and device processing, advanced storage technology, and the technology and processes of illumination and display devices.

### Processing

This department focuses on the research and development of the processes and techniques of laser

welding, powder metallurgy and sintering techniques, alloy designation and high temperature smelting, high performance alloys, surface modifications, thin film coatings, and solid thin film cells.

## EQUIPMENTS

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### ■ Electron Microscope Lab

SEM XL-30, TEM:JOEL 1000XII, STEM:JEOL JEM2000EX, EPMA:JEOL JXA-8600SX, FEG-TEM:Philips TECNAI F30

High Power (18kW) X-ray diffractometer: Rigaku TTRAX III

### ■ Material Lab

MTS, Impact Tester, Hardness Tester

### ■ Thermal Analysis Lab

Thermal Analysis Facilities : - TGA -DSC -DTAD -DMA Carbon/Sulfur Determinator, Oxygen/Nitrogen Determinator

### ■ Metallographic Lab

Microscopes-Optical microscope, Stereo microscope, Multi-function microscope, Measurable microscope, Cutting Machine, Grinding, Polishing Machine, Mounting Press Machine

### ■ Electronic Packaging Lab

Ultra high vacuum sputtering system, High vacuum heat treatment furnace

Vibrating sample magnetometer, High frequency heating furnace

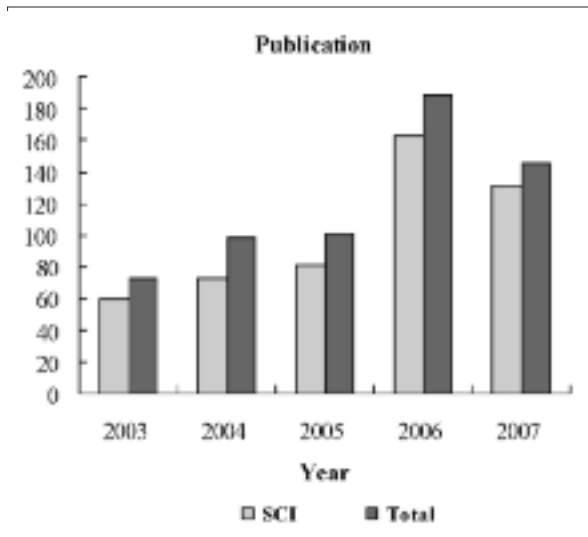
### ■ Smart Memory Materials Lab

Ferroelectric analyzer, Precision diamond saw, En-

vironment chamber

Strain amplifier, high temperature sintering oven

#### ■ Structural Intermetallics Lab



Differential Scanning Calorimetry (DSC), DC/RF Sputtering Equipment

Dynamic Mechanical Analyzer (DMA),  $\alpha$ -stepper, Optical Spectrometer

Infrared Furnace, Vacuum Arc Remelter (VAR), Optical Microscopy

High Vacuum Furnace, Heating Furnace, Diamond Cutter, Wear Tester

#### ■ Powder Metallurgy Lab

40 ton ARBURG-injection molding machine, Horiba carbon/sulfur analyzer, 100 ton press, Cyclometer, Rattler tester, Four point bend tester

Vacuum furnace, Debinding furnace, Sintering furnace, Fisher subsieve sizer

#### ■ Surface Modification Lab

Potentiostat/Galvanostat, Function/Arbitrary Waveform Generator

NF electronic Power Amplifier TA250 W/ V0-40

Oscillator

Electrochemical Impedance Spectroscopy (Frequency Response Detector)

Oxygen/Conductivity/pH Meter, Rotating Disk Electrode

Data Acquisition(DAQ) Hardware

#### ■ Dynamic Test Lab

Rofin-Sinar 850, 5KW CO<sub>2</sub> LASER

#### ■ Semiconductor Optoelectronic Materials LAB

Time-of-flight mobility measurement system

Time-resolved photoluminescence spectroscopy

#### ■ Nano-Optoelectronic Polymer Lab

1000W Xenon Arc Lamp Light Source, Vacuum Deposition Equipment

Vacuum Evaporator, Automatic Atmosphere Chamber

#### ■ Frontier Materials Lab

Atomic Force Microscope, Scanning Near-Field Optical Microscopy

Photoluminescence spectroscopy, UV-Vis absorption spectroscopy

#### ■ Nanoelectronic And Nanophotonic Materials Lab

Atomic layer deposition

Low temperature photoluminescence spectroscopy

#### ■ Vacuum Melting of Alloys Lab

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Rotating electrodes, Vacuum arc melting

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New-type equipment-fluorine gas generator

High frequency introduction furnace

■ **Optoelectronic Thin-film Processing Lab**

Atomic Layer Deposition systems

Plasma Enhanced Atomic Layer Deposition systems

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■ **Structure and Properties of Polymer Lab**

Differential Scanning Calorimeter

Dielectric analyzer

■ **Nano Optoelectronics Lab**

Constant temperature & humidity Incubator-Balance Control

Finite-difference time domains (FDTD)

High temperature furnace

UV-visible spectrometer

## VISION AND MISSION

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Our vision is to be an energetic, exciting, enthusiastic, and supportive department for materials scientists and engineers, developing the fundamental and underlying principles and enabling graduates to conduct highly advanced research at home and abroad.

To realize our vision, we must make the following efforts:

- (1) Meticulously train the most highly valued materials science and engineering students so that high-level scientists and engineers can be nurtured;
- (2) Advance a fundamental understanding of materials processing, structural properties, and applications by performing highly advanced research in collaboration with world-class industry and academic leaders;
- (3) Engage in collaborative research efforts with industrial, corporate, and academic partners worldwide.

## CONTACT INFORMATION

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Established in :1982

Chair: Jer-Ren yang

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# 6. GRADUATE INSTITUTE OF ENVIRONMENTAL ENGINEERING

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## INTRODUCTION

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The Graduate Institute of Environmental Engineering (GIEE) was formerly known as the Division of Sanitary Engineering, Graduate Institute of Civil Engineering at National Taiwan University. In August 1977, GIEE was established by the Ministry of Education for the purpose of creating mature scientists and engineers in the field of Environmental Engineering. In August 1985, the Ph.D. program was established. At GIEE, basic and applied research is conducted to tackle current and future environmental problems in Taiwan. In August 1998, the master program was divided into two sub-programs, Environmental Science and Engineering and Environmental Planning and Management. Further, in August 1999 the Environmental Planning and Management program established an on-the-job master program for part-time students. There were 193 students at the Institute in 2003, including 119 master program students, and 74 doctoral students. More than 750 students have graduated from the Institute since 1980, and 17 full-time and 7 part-time faculty members are currently on staff. In addition, faculties from Civil Engineering and other departments offer courses at GIEE. The Institute cooperates with other departments to utilize all the resources of NTU.

Because of rapid economic development, a high standard of living has been achieved in Taiwan. However, heavy industrialization and a high population density have begun to degrade the environment. With the resulting increase in public awareness, environmental engineering has become one of the most important fields of science and technology. GIEE's mission is to develop ways and means to improve our environment and to eliminate adverse effects caused by modern civilization. Thus, our goals are as follows.

### Specialization and Generalization

GIEE plans to strengthen the faculty, the staff, and the research facilities, not only in water pollution control, but also in air pollution control and solid waste management. This goal can be achieved by inviting distinguished overseas scholars from various disciplines to give lectures and seminars and to conduct research programs. Also, GIEE plans to enhance useful environmental management programs in decision-making, planning, construction, control, and enforcement of environmental protection.



## Interdepartmental Cooperation

Environmental Engineering is a highly diversified field of science and technology. GIEE plans to maintain close relations with other graduate schools, departments, and research centers from other universities and institutes.

## Industrial Cooperation

Without practical application, the knowledge and technology developed in an academic institution is limited to the classroom. Thus, cooperation between industry and academia is beneficial to both. Academia needs support from industry to conduct research projects, and industry requires the applicable technology developed by academia to solve their problems. Only through this joint effort will the conservation of our environment become possible.

Research Center for Environmental Pollution Prevention and Control Technology

This Center consists of five research divisions: Instrumental Laboratory, Wastes Minimization and Resources Recovery and Utilization Laboratory, Water and Waste Water Treatment and Advanced Oxidation Technology Laboratory, Environmental Nano-technology Laboratory, and Clean Production and Industrial Ecology Laboratory. The center not only provides services for research cooperation with government and non-government organizations, industry, and research and academic institutes, but also enhances our educational and research capabilities.

## FACULTY

Full-time: 17

Part-time: 7

Ph.D. Degree: 23

M.S. Degree : 1

### Director/ Professor

Shian-Chee Wu      Ph.D. Civil Engineering,  
Massachusetts Institute  
of Technology, U.S.A.

### Full-time

#### Professor

Yue-Hwa Yu      Ph.D. Civil Engineering,  
Washington University  
(St. Louis), U.S.A.

Len-Fu Chang      Ph.D. Meteorology Univer-  
sity of Oklahoma, U.S.A.

Ching-Yuan Chang      Ph.D. Chemical Engineer-  
ing, Auburn University,  
U.S.A.

Fu-Tien Jeng      Ph.D. Civil Engineering,  
NTU

Pen-Chi Chiang      Ph.D. Civil Engineering,  
Purdue University, U.S.A.

Shang-Lien Lo      Ph.D. Civil Engineering,  
NTU

Cheng-Fang Lin      Ph.D. Civil Engineering,  
University of Washington  
(Seattle), U.S.A.

Kung-Cheh Li      Ph.D. Civil Engineering,  
University of Oklahoma,  
U.S.A.



Hwong-Wen Ma Ph.D. Environmental Engineering, University of North Carolina at Chapel Hill, U.S.A.

Whei-May Lee Ph.D. Civil Engineering, Purdue University, U.S.A.

#### Associate Professor

Yii-Der You Ph.D. Environmental Planning and Conservation, University of Hannover, Germany

#### Assistant Professor

Yu-Chen Lin Ph.D. Environmental Engineering, Stanford University, U.S.A.

Hsin-His Tung Ph.D. Environmental Engineering, Pennsylvania State University, U.S.A.

Pei-Te Chiueh Ph.D. Environmental Engineering, NTU

#### Distinguished Research Chair Professor

Liang-Shih Fan Ph.D. Chemical Engineering, West Virginia University

#### Distinguished Chair Professor

Chin-Pao Huang Ph.D. Aquatic Chemistry, Harvard University

#### Part-time

#### Professor

Wan-Fa Yang Ph.D. Civil Engineering, N. Caroline State University, U.S.A.

Wolfgang H. Hoell Ph.D. Chemical Engineering, University of Karlsruhe, Germany

Szu-Kung Tseng M.S. Civil Engineering, Manhattan College, U.S.A.

Jen-Yang Lin Ph.D. Hydraulic Engineering, Kassel University, Germany

Timothy Clark Keener

Ph.D. Civil (Env.) Engineering, The University of Tennessee

#### Assistant Professor

Shui-Hway Yen Ph.D. Environmental Engineering, NTU

Ming-Lone Liou Ph.D. Environmental Engineering, NTU.

## FACILITIES

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### Laboratory facilities in the GIEE include:

1. Environmental Chemistry Laboratory:  
Analytical balances, pH meter, conductivity meter, spectrophotometers, electric muffle furnace, turbidimeters, oxygen analyzers, gel electrophoresis apparatus, ORP monitor and controller, ozone generators, thermostats, exhaust hoods, microwave digestion system, germanium well detector and multichannel analyzer.
2. Environmental Microbiology Laboratory:  
Autoclaves, BOD incubator, cultural incubator, milipore filtration apparatus, colony counter, shaking bath, laminar flow hood, microscopes, ovens, low temperature incubator, zeta potential meter, inverted plankton microscope and epifluorescence equipment.
3. Unit Operation Laboratory: Reverse osmosis unit, centrifuge, walk-in incubator, electro dialysis units for water and wastewater treatment processing.
4. Special Instruments Room: Gas chromatograph, atomic absorption spectrophotometer, liquid chromatograph, TOC analyzer, infrared spectrophotometer, ion chromatograph, polarographic analyzer, mercury analyzer, granulometer, elemental analyzer, UV/VIS spectrophotometer, GC/MS, FTIR, fluorescence spectrophotometer and ICP.
5. Air Pollution Control Laboratory: High volume sampler, PM-10 sampler, SO<sub>x</sub> analyzer, NO<sub>x</sub> analyzer, CO analyzer, H<sub>2</sub>S analyzer, Cl<sub>2</sub> analyzer, particle fractionating sampler, stack sampler, noise detector, O<sub>3</sub> analyzer, HC analyzer, high-temperature-type anemometer and portable weather system.
6. Environmental Planning and Design Room:  
Audio and video educational equipment.
7. Solid Waste Laboratory: Oven, calorimeter, TGA, TCLP analysis system and stabilization & solidification system.
8. Computer Room: PC, IBM-compatible PC, Apple Macintosh SE and Power Mac CDC & VAX terminals.

The University's library has more than 85,000 books on basic science, environmental science and engineering, water pollution, air pollution, instrumental analysis, environmental planning and design, and environmental impact assessment, solid waste management to provide students and faculty research reference materials. Also, approximately 70 journals on environmental science and engineering are available for students' use. The Institute library's special collection includes reports on faculty projects, student theses and dissertations and conference proceeding. Funding for the purchase of these materials is provided by the University's library system, the Natural Science Foundation, the Engineering Center, and the Institute's research funds. Books and magazines are also donated to the Institute by alumni and faculty.

## COURSES

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### Instructional Goal

Educating mature scientists, engineers, and managers in environmental conservation, environmental planning, technological research and development, and academic research.

### Curricular Programs

1. The academic program is designed to adapt theory and practice. The theoretical portion is concentrated on chemistry, biology, and physics. The practical portion of the program includes laboratory work and design courses.
2. Waste water, waste gas, and solid waste treatment equipment is provided to give students practical waste management experience.
3. Prerequisite and core courses are designed to give students a thorough understanding of a wide range of subjects.
4. The curriculum includes a wide variety of environmental science and engineering technology courses.

### Instructional Programs

GIEE offers a 2-year graduate program leading to a Master of Science degree. Masters degree candidates are required to complete 30 credits of course work and pass an oral examination on their research (thesis).

GIEE further offers a doctoral program in which Ph.D. candidates are required to complete at least 24 credits of course work and pass an oral examination on their research (thesis).

### Research Programs

Basic and applied research is conducted at the Institute with an emphasis on solving current environmental problems in Taiwan. The current areas of research are as follows: Water Pollution Control, Water Purification Technology, Wastewater Treatment Technology, Wastewater Reclamation and Reuse, Air Pollution Control, Energy, Resources and Environment, Hazardous Waste Management, Land Disposal, Waste Minimization, Recycling of Wastes and Reuse of Biomass Energy, Soil and Groundwater Pollution, Environmental Impact Assessment, Environmental Planning, Design and Conservation, Environmental Risk Assessment, Environmental Systems Analysis, Life Cycle Analysis, Clean Production Technology, Sustainable Development, Environmental bio-technology, environmental nano-technology and environmental information technology.

## ACADEMIC ACTIVITIES

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1. KAIST-KU-NTU-NUS Seminar on Environmental Engineering is held annually and taken turn by Korea Advanced Institute of Science and Technology, Kyoto University, National Taiwan University, and The National University of Singapore.
2. Symposium on Environmental Protection is annually hosted in turn by National Taiwan University, National Central University, National Chiao-Tung University, National Cheng-Kung University, Ching-Hua University, Hang-Chou University, and Tung-Chi University.
3. Other regular activities include : Workshop and Conference on Sustainable Development, Conference on Waste Water Treatment, Conference on Air Pollution Control Technology, Conference on Waste Solid Treatment Technology, and Conference on Environmental Planning and Management.
4. Edit and manage the publication of Journal of The Chinese Institute of Environmental Engineering.
5. Other special activities include : academic exchange visits, invited lectures, and workshops and conferences with industry and government agencies.

## CONTACT INFORMATION

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Established in: 1977

Director: Shian-Chee Wu

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E-mail: [giee@ntu.edu.tw](mailto:giee@ntu.edu.tw)

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# 7. GRADUATE INSTITUTE OF APPLIED MECHANICS

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## INTRODUCTION

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The Institute was founded in 1984 under a special Government directive to establish an international standard graduate institute in applied mechanics. The Institute has grown from a faculty of 7 in 1984 to 30 at the present. Most of the research has been sponsored by grants from Government agencies and industry.

Since 1994, the Institute has been shifting course from defense-related research to an interdisciplinary and integrated research approach in step with the technological trend of the world and the development needs of the nation. This new research direction embraces such diverse areas as mechanics, nanotechnology, biomechanics, biomedical research, information, and mechatronics. Further, the Institute has identified three major fields in connection with the "mechanics in nano-revolution." These fields are:

1. Waves and MEMS/NEMS, with focus on analyses and applications of the elastic waves and electromagnetic waves and their interactions.
2. Nano-biomechanics, focusing on the examination of characteristics and interactions of micro- or nano-scale biological structures by a mechanical approach.
3. Meso-scale mechanical systems, exploring the analytic, experimental, and computational aspects of the systems.

## FACULTY

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Full-time: 30

Ph.D. Degree: 30

M.S. Degree: 0

### Director/ Professor

Chien-Cheng Chang Mathematics, University of California, Berkeley

### Full-time

#### Professor

Kuang-Chong Wu Theoretical & Applied Mechanics, Cornell University

Mao-Kuen Kuo Civil Engineering, Northwestern University

Chia-Ou Chang Mechanical Engineering, University of Iowa

Jaw-Yen Yang Aerospace Engineering, Stanford University

Tsung-Tsong Wu Theoretical & Applied Mechanics, Cornell University

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Jeng-Shian Chang	Mechanical Engineering, Syracuse University	Yi-Chung Shu	Applied Mechanics, California Institute of Technology
U Lei	Mechanical Engineering, University of California, Berkeley	Kuo-Ching Chen	Institute of Applied Mechanics, NTU
Falin Chen	Aeronautics and Mechanics, University of Arizona	Shiming Lin	Institute of Biotechnology, University of Cambridge, U.K.
Chih-Kung Lee	Theoretical & Applied Mechanics, Cornell University	Chii-Wann Lin	Case Western Reserve University, U.S.A.
Chan-Shin Chou	Physics, St. Andrews University, UK	Shwu-Bin Lin	The Johns Hopkins University, U.S.A.
Chin-Chou Chu	Mechanical Engineering, Michigan State University	<b>Associate Professors</b>	
Pei-Ling Liu	Civil Engineering, University of California, Berkeley	Tzong-Shyan Wung	Mechanical Engineering, University of Iowa
Andrew M. Wo	Aeronautics & Astronautics, Massachusetts Institute of Technology	Long-Sun Huang	Mechanical & Aerospace Engineering & Aerospace Engineering, University of California, Los Angeles
Li-Sheng Wang	Electrical Engineering, University of Maryland	Ruey-Lin Chen	Institute of Applied Mechanics, NTU
Horn-Jiuun Sheen	Mechanical Engineering, State University of New York at Stony Brook	Sheng-Der Chao	Physics, NTU
Pei-Zen Chang	Theoretical & Applied Mechanics, Cornell University	<b>Assistant Professor</b>	
Chao-Hsun Chen	Applied Mechanics, University of Illinois, Chicago	Jian-Zhang Chen	Princeton University, U.S.A.
An-Bang Wang	Fluid Mechanics, Friedrich-Alexander- Universitat, Erlangen-Nurnberg, Germany		
Yio-Wha R. Shau	Aerospace, University of Texas, Austin		

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## FACILITIES

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The Institute now has four teaching laboratories and twenty-four research laboratories. In addition, the Institute operates the MEMS Center of the National Science Council (Northern Region).

### The teaching laboratories include:

1. Dynamics Lab.
2. Fluid Mechanics Lab.
3. Mechanics of Materials Lab.
4. Electronics Lab.

### The research labs include:

1. Aerodynamics Design and analysis Lab.
2. Bio-electromechanical Lab.
3. Biomedical Ultrasound Lab.
4. Bionics Engineering Lab.
5. Polymer Composite Lab.
6. Microfluidics Lab.
7. Advanced storage Technology Lab.
8. Thermal Science and Flow Control Lab.
9. Vortex Dynamics & Biomedical Microsystem Lab.
10. Structural Integrity Evaluation Lab.
11. Impact and Precision Measurement Lab.
12. Vibration dynamics Lab.
13. Micro-Channel Flow and Bio-Chip Lab.
14. Attitude Dynamics Lab.
15. Study for nano/micro mechanics.
16. Quantitative Flow Visualization Lab.
17. Ultrasonics Lab.
18. Applied Energy Environment Fluid Lab.

19. Wave and Fracture Mechanics Lab.
20. Anisotropic and Nano Materials Computational Solid Mechanics Lab.
21. Center for Wireless NanoBio Systems
22. Micro-Fabrication Teaching Lab.
23. Atomic Force Microscope Lab.
24. Bio-Nanotechnology Lab.

### The laboratories of the National Science Council MEMS Center (Northern Region) Include:

1. Photolithography Room - double-side make aligner, thick PR spin coater
2. Wet Etching Room - chemical hoods with chemical waste collecting system
3. Deposition Room - reactive ion etcher, sputter, electron-gun evaporator, thermal evaporator, furnace
4. Measurement Room - surface profiler, probe station
5. CAD Room - PC's, workstations, CAD software

## COURSES

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The Institute offers both Master (M.S.) and Doctoral (Ph.D.) degree programs. These graduate programs emphasize theoretical and experimental aspects of applied mechanics. Students are admitted from all disciplines of engineering and science. Approximately 70 masters, 18 doctoral, and a few foreign students are admitted each year. A total of roughly 1,122 masters and 149 doctoral students have graduated thus far.



Masters students are required to complete 27 credits and write an original thesis. The course work includes: Electronics Lab, Applied Mechanics Lab. I, and Applied Math. I. In addition, two out of four courses of Dynamics, Elasticity, Fluid Mechanics and Electromagnetism are required. Doctoral course work requires Applied Mechanics Lab. II and Electronics Lab., with a total of 30 credits plus Institute seminars. A doctoral candidate must also pass the comprehensive examination and defend an original thesis.

The following graduate courses are offered in the Institute: Finite Element Method, Mechanical Vibrations & Waves, Stress Wave Propagation, Nondestructive Evaluation of Materials, Fracture Mechanics, Microstructure and Macroscopic Behavior of Materials, Introduction to Active Materials, Introduction to Turbulence, Compressible Flow, Viscous Flow, Bio-fluid Dynamics, Biomechanics and Introduction to MEMS (Micro-Electro-Mechanical System), Design And Fabrication Development of MEMS, Special Topics in Electronic Packaging, Quantum Mechanics, Experiments in Electronics, Experiments in Applied Mechanics.

## ACADEMIC ACTIVITIES

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We hold an Institute-wide seminar weekly, and invite prominent researchers from within Taiwan and abroad. We also regularly invite well-known researchers to visit our Institute and to teach courses. Institute faculty members organize international conferences. The Institute also organizes mini-courses on Nano/MEMS technology and holds mechanics competitions for high school students.

## CONTACT INFORMATION

---

Established in: 1984

Director: Chien-Cheng Chang

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# 8. GRADUATE INSTITUTE OF BUILDING AND PLANNING

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## INTRODUCTION

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A side door of the old building of the College of Engineering was opened in the spring of 1982. Prof. Shen-Tao Mao, the Chairperson of the Department of Civil Engineering wrote couplets for the occasion to frame the doorway: "No Famous Mountain in Front of the Green Courtyard" on the right, "Extraordinary People at the Back of the Red Tower" on the left, and "Legend of the Mountain" across on the top of the door. This place housing extraordinary people was the forerunner of the Graduate Institute of Building and Planning, and was called the Studio of Urban Planning at that time. In the autumn of 1976, the Transportation Division Section B (Urban Planning) was established in the Graduate Institute of Civil Engineering. Twelve years later, in 1988, the Graduate Institute of Building and Planning was established as an independent Graduate Institute.

## SPECIAL FEATURES

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### Professional Training with General Knowledge

The Institute accepts students from various undergraduate fields. It reflects the complexity of the

real world. The students are expected to cultivate width and depth in their knowledge, skills, and awareness of social and political processes. The Institute seeks to produce socially responsible professional planners and designers.

### Policy Analysis Based on Spatial Planning and Design

Taiwan is experiencing rapid economic liberalization and political democratization leading to increased demand for improvements in environmental quality. It offers opportunities for architects and urban planners to participate in public affairs and decisions. Many of our outstanding graduates are currently engaged in public decision making with special emphasis in empowering local communities.

### Spirit of Critical Self-reflection

Emphasis is placed on the importance of learning interactively within the complexity of the real world. Courses focus not on form making, but on the social and cultural meanings of the constructed environment: special attention is paid to developing action-planning skills, which integrate theory with practice.

## Inter-school Cooperation

The Institute frequently hosts international conferences and initiates multi-disciplinary projects to share knowledge with other architecture and planning schools.

## FACULTY

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Full-time: 14

Part-time: 18

Ph.D. Degree: 25

M.S. Degree: 6

Others: 1

### Director/ Professor

Chu-Joe Hsia      Ph.D. Architecture, University of California, Berkeley, U.S.A.

### Full Time Professors

#### Professor Emeritus

Hung-Kai Wang      Ph.D., Urban Planning, Columbia University, U.S.A.

#### Professors

Chien-Yuan Lin      Ph.D., Transportation Planning, University of Washington, Seattle, U.S.A.

Feng-Tyan Lin      Ph.D., Computer Science, Northwestern University, U.S.A.

Liang-Chun Che      Dr. of Engineering, Waseda University, Japan

Shin-Kun Pen      Ph.D., Regional Science, University of Pennsylvania, U.S.A.

John K.C. Liu      Ph.D., Architecture, University of California, Berkeley, U.S.A.

#### Associate Professor

Heng-Dar Bih      Ph.D., Environmental Psychology, The City University of New York, New York, U.S.A.

Sheng Lin Chang      Ph.D., Environmental Planning, The University of California, Berkeley, CA., U.S.A.

Min-Jay Kang      Ph.D., Urban Design and Planning, University of Washington, U.S.A.

Chih-hung Wang      Ph.D., Graduate Institute of Building and Planning, National Taiwan University, R. O.C.

RishangChiang      Ph.D., Civil and Environmental Engineering, Massachusetts Institute of Technology, U.S.A.

Lan-Shiang Huang      Dr. of Architecture, Kyoto University, Japan

#### Assistant Professor

Li-Ling Huang      Ph.D., Graduate Institute of Building and Planning, National Taiwan University, R. O.C.

### Part-Time Professors

Chang-I Hua	Ph.D., Urban and Regional Planning, Harvard University
Hong Hsu	Ph.D., History, National Taiwan University. R. O.C.
Chung-Hsin Yang	Ph.D., Regional Science, University of Pennsylvania, U.S.A.
Shu-Li Huang	Ph.D., Urban and Regional Planning, University of Pennsylvania, U.S.A.
Lu-Hsi Cheng	Ph.D., Sociology, University of Hawaii, U.S.A.
Wan-Wen Chu	Ph.D., Economics, Stanford University, U.S.A.
Chih-Chih Wang	Research College of Politics and Economics, University of London, U.K.
Hsu Yu-Chien	Ph.D., Civil Engineering, National Taiwan University. R. O.C.
Hsung-Hsiung Tsai	Ph.D., Urban Planning, Princeton University, U.S.A.

### Assistant Professor

Liang-Chih Chen	Ph.D., Civil and Regional, University of California at Berkeley, U.S.A.
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### Visitor Associate Professor

You-tien Chen	Ph.D., City and Regional Planning, University of California at Berkeley, U.S.A.
Pao-Teh Han	M., Architecture, Harvard University., U.S.A.

Chang-Lin Hua	M., Landscape Architecture, Harvard University., U.S.A.
Kris Yao M.,	Architecture, University of California at Berkeley, U.S.A.
Kun-Yen Teng	Taiwan Provincial Institute of Agriculture, R.O.C.
Yu-Chen Chen M.,	Civil Engineering of Building and Planning National Taiwan University, R.O.C.

## FACILITIES

The Institute was founded in August 1988. The facilities, including a library, were bequeathed by the Institute's predecessor, the Studio of Urban Planning in the Graduate Institute. New teaching and research equipment is continually procured.

## COURSES

Following the emphasis on a "generalized professional training," our curriculum is designed to provide students with various core courses on essential knowledge and techniques of environmental planning and design. Therefore, the program focuses on a series of studios, which enable students to have first-hand experiences of professional practice as well as to integrate knowledge and skills of various necessary disciplines. Surrounding the studios, a range of lecture courses on History and Theory, Analysis, and Synthesis as well as Implementation and Management of the Physical environment are offered to form a basic cur-

riculum for professionals. In addition, more technical courses in the program are to be taken according to the students' interests and their own career plans, thus making the curriculum both integrated and flexible.

Master's degree candidates must successfully complete at least 39 credits of courses (including 18 credits of studios courses and at least 21 credits of lecture courses, excluding foreign languages), and write a thesis. Doctoral degree candidates must successfully complete at least 24 credits of courses (excluding foreign languages and dissertation).

The following courses were offered in the Graduate Institute of Building and Planning between 2009 and 2010:

**Hung-Kai Wang:**

Local development in post-reform china

**Chu-Joe Hsia:**

Introduction to architecture, Research methods: Information society and city, Introduction to information society and city, Seminar on reflexive studies of china: heritage and frontiers, Research methods: architectural history and architectural criticism, Architectural theories and urban theories, Research methods: urban history.

**John K.C. Liu**

Workshop of environmental Planning and design (iii) b, Workshop of environmental planning and design (iii) c, Basic environmental planning and design (i), Basic environmental planning and design (ii), Work-

shop of environmental planning and design (i)2.

**Liang-Chun Chen:**

Workshop of environmental planning and design (i) 1, Workshop of environmental planning and design (ii) 2, Workshop of environmental planning and design (iii) a, Planning and programming for residential environment, Urban security and resistance, Specially topics in disaster management.

**Chien-Yuan Lin:**

Land development and management, Special topics on Urban regeneration, Special topics on urban leisure and tourism.

**Feng-Tyan Lin:**

Theory of computer-aided spatial planning and design, Geographic information system, The logic space, Workshop of environmental planning and design (iii) b, Workshop of environmental planning (i) 1.

**Shin-Kun Pen:**

Urban economics

**Herng-Dar Bih:**

Thesis writing Environmental psychology, Qualitative research, Street art, Human environment relations.

**Sheng Lin Chang:**

Landscape and identity: place marking across world cultures.

**Min-Jay Kang:**

Workshop of environmental planning (i) 1, Urban design theory and guideline.

**Chin-Hung Wang:**

Theories of environmental planning and design, Political of space.

**Lan-Shiang Huang:**

Colonial cities and architecture in Asia, Eastern Asia architecture, Studies in the history of Chinese Architecture, A history of the tang and sung dynasties.

**Risharng Chiang:**

Statistical methods for the social science, Seminars on infrastructure policy and governance, Seminar on the politics of urban development,

**Li-Ling Huang:**

Theories of environmental planning and design, Workshop of environmental planning and design (iii) 2, Special topic on livable cities, Globalization of asian cities, Community building: theory. method and criticism.

**Liang-Chih Chen:**

Introduction to urban and regional economic development, Workshop of environmental planning (i) 1.

**You-Teh Han:**

History architecture and urbanism.

**Chang-I Hua:**

Issues in national landuse planning.

**Chung-Hsin Yang:**

Function and structure of urban community.

**Kris Yao:**

Workshop of environmental planning and design (iv) b.

**Kun-Yen Teng:**

Workshop of environmental planning and design (v) a.

**Cheng-Dar Yue:**

Sustainable technologies and renewable energy.

## RESEARCH / DEVELOPMENT

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**Research:**

**Business/Industrial Park and National Comprehensive Development**

**Planning :Research director: Prof. Chien-Yuan Lin**

Research areas include planning and development of business/industrial park, decision support system, land development control, and environmental conflict management, infrastructure planning.

**Computer aided planning and design:Research director: Prof. Feng-Tyan Lin**

The goal of this research group is to integrate computer technology, information science, and theories of planning and design properly. In other words, various technologies (including geographical infor-

mation systems, computer aided architectural design, internet, visual simulation, virtual reality, expert systems, decision support systems, and case based reasoning) are employed to support studies of comprehensive plans, disaster prevention programs, transportation network plan, information city, community websites, design reasoning, building code visualization, etc.

**Seminar on Theories and Histories:Research director: Prof. Chu-Joe Hsia**

This seminar aims at converging the dynamics of histories and theories in our Institute. The historical studies include architectural history, urban history, landscape history, planning history, and design history. The theoretical studies include encouraging dialogue between design theories.

**Cultural Studies and Political Economy of Space:Research director: Prof. Chu-Joe Hsia**

This seminar encourages empirical studies and comparative studies on Taiwan, Hong Kong, China, and even the Asian Pacific, including the topics from urban policies, urban symbolic, to urban movements. Considering the recent contribution of the cultural studies, exploring the possibilities of theoretical dialogue between political economy and cultural studies is also one of our targets.

**Gender and Space:Research director: Prof. Heng-Dar Bih**

Conducting research on the physical environment from feminist perspective and publishing the Newsletter of the Research Center of Gender and Space.

**Environment and Disaster Studio:Research director: Prof. Liang-Chun Chen**

The research fields of large-scale disasters, hazard mitigation and response have expanded rapidly. As compared with most studies, which put emphasis on engineering, science and technology, the topics of this studio stress human concerns. Special issues include construction and practice of hazard mitigation systems, community based hazard mitigation and hazard-prevention community, and cities' hazard mitigation planning, etc.

**Community planning and design:Planning design director: Prof. John K.C. Liu**

Research and practice in community planning and design including issues in participation and environmental justice. Real projects and a professional staff assist in the training of student.

**Research Center for Globalizing Cities: Research Director: Prof. Liling Huang**

The Research Center for Globalizing Cities was established in March 2008 under the Graduate Institute of Building and Planning with a vision to meet the challenge brought on by the increasingly integrated Asian regional and urban networks. The



Center focuses on researching following issues of Asian cities: (1) How do the Mega-Urban Regions (MUR) and urban transformation take place? (2) How do the changing urban structures affect the livability of cities?(3)How does the civil society responses to the urban transformation? (4)What are the innovative initiatives from the governments of different levels to proceed on the new urban and regional governance?(5)What are the new regional interactions among the Asian cities under the global dynamics?

## **FUTURE DEVELOPMENT**

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The Institute's goal is a professional training within a liberal education framework. This orientation is particularly imperative in the profession of design and planning, which requires interdisciplinary training and calls for integrating academic learning with real world practices. Accordingly, our educational objective is to prepare the students with: (a) the sensitivity of observing the complex interactions between human being and the environment; (b) the skill of analyzing the social, economic, and political forces that shape and constrain the physical reality, the planning process, and the implementations of planning; (c) basic communication skills including writing, oral, and visual presentations.

## **CONTACT INFORMATION**

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Established in: 1988

Director: Chu-Joe Hsia

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E-mail: [ntubp@ntu.edu.tw](mailto:ntubp@ntu.edu.tw)



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# 9. GRADUATE INSTITUTE OF INDUSTRIAL ENGINEERING

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## INTRODUCTION

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The Institute of Industrial Engineering (IIE) was established in 1994 and started to offer the M.S. program in the same year. IIE currently offers programs in three major fields: production systems and processes, operations and information systems, and technology management. In collaboration with the Department of Mechanical Engineering, a Ph.D. program in Industrial Engineering and Management was started in 2003. IIE is especially known for its advanced research in semiconductor manufacturing systems. The co-op research funding received from the domestic companies is unrivaled in Taiwan. It is also the first institute in Taiwan to win the research grant from Semiconductor Research Corp. and International Semiconductor Manufacturing Initiatives, Inc. It received research funding of US\$550,000 from 2001 to 2006 with two research projects. Many students have participated in the projects. Research issues and ideas were exchanged and discussed through regular international teleconferences and mutual visits with the members of semiconductor companies in the US and Germany. The semiconductor research in IIE has continued to advance, flourish and internationalize. In addition, IIE faculty members and students have won awards in numerous paper competitions. Recent awards include CIIE Master Thesis Award,

U.S.A./European AEC/APC Conference Outstanding Student Paper Award, DHL Logistic Management Thesis Award and, Toyota Management Thesis Award, Ministry-of-Economics Industrial Safety Conference Outstanding Paper Award, etc.

## FACULTY

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Full-Time: 15

Part-time: 3

Faculty with Ph.D. Degree: 18

### Director/Professor

Argon Chen	Ph.D., State University of New Jersey, Rutgers. Statistical Inference, Supply Chain Data Mining, Engineering Data Mining, Bio-medical Data Mining
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### Full-time

#### Professor

Yon-Chun Chou	Ph.D., Purdue Univ. Industrial Economics, Manufacturing and Capacity Strategy, Supply Chain Systems, Semiconductor Manufacturing.
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- Han-Pang Huang Ph.D., Univ. of Michigan  
Ann Arbor ,RFID Systems & Applications,Robotics, CIM, Fuzzy & Neural Systems, Machine Vision.
- Wen-Fang Wu Ph.D., Univ. of Illinois at Urbana-Champaign, U.S.A.  
Stochastic Processes and Applications, Reliability Engineering, Probabilistic Risk Assessment.
- Shi-Chung Chang Ph.D., Univ. of Connecticut  
Optimization Theory & Algorithm, High Speed Networking, Distributed Decision Making, Systems & Control.
- Zsehong Tsai Ph.D., UCLA  
Computer Network, Efficiency Estimation.
- Dar-Zen Chen Ph.D., Univ. of Maryland, U.S.A.  
Intellectual Resources Planning, Patentometrics, Mechanism Design, Kinematics.
- Su-Hua Hsieh Ph.D., Univ. of Wisconsin-Madison, U.S.A  
Factory Automation, Manufacturing System Design and Simulation
- Ming-Huang Chiang Ph. D., Univ. of Iowa  
Management Science, Production and Operations Management, Operations Research, Statistics, Logistics Management, Supply Chain Management, Enterprise Resource Planning, Electronic Business and Supply Chain Management
- Chih-Jen Lin Ph.D., Univ. of Michigan  
Machine Learning, Scientific Computing, Operational Research.
- Associate Professor**
- Ming-Tzong Wang Ph.D., Purdue Univ.  
Automation & Business Logistics System, Concurrent Engineering , CAD/CAPP/CAM, System & Project ManagManagement.
- Feng-Cheng Yang Ph.D., Univ. of Iowa  
CIM, CAD/CAM/CAE, Object-Oriented System Analysis & Design, Engineering Information Management.
- Assistant Professor**
- Cheng-Hung Wu Ph.D., Industrial and Operations Engineering, University of Michigan  
Operations Research, Decisions under Uncertainty,

I-Hsuan Hong Stochastic Dynamic Control, Operations Management  
 Ph.D., Industrial and Systems Engineering, George Tech  
 Game theory with applications · Reverse Supply Chain System · Robust Optimization Theory

Kwei-Long Ph.D., Industrial and Manufacturing Engineering Pennsylvania State University  
 Applications and algorithms of Scheduling · Optimization theory · Supply chain management

**Chair Research Fellow**

Way Kuo President and University Distinguished Professor.  
 Member of the US National Academy of Engineering.  
 Academia Sinica in Taiwan.  
 Engineering? Science · Reliability Engineering?

**Part-time Professors**

Ching-Jong Liao Ph.D., Pennsylvania State University, U.S.A.  
 Scheduling Theory, Inventory Control.

Hsiao-Fan Wang Ph.D. in Operation Research, Cambridge University

Chun-Hung Chen Mathematical Programming, Fuzzy Set Theory, Multicriteria Decision Analysis  
 Ph.D. Division of Engineering and Applied Sciences  
 Stochastic Simulation, Decisions Research

**Visiting Professor**

Chung-Yee Lee PhD, Yale University  
 Logistics and Supply Chain Management, Production Scheduling, Operations Management

Ben Wang Ph.D., Industrial Engineering , Pennsylvania State University  
 Nanomanufactruing, Clean manufacturing, Research methodology

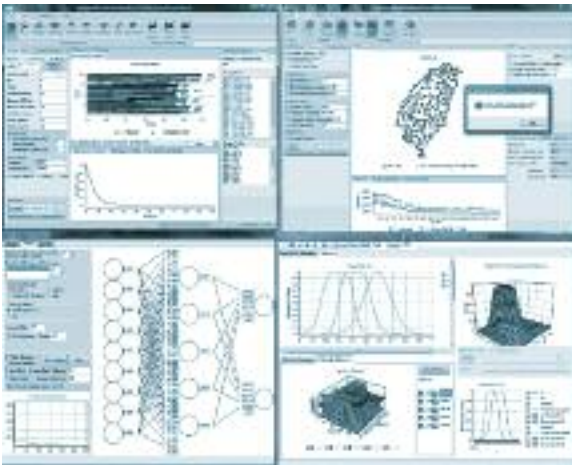
**Visiting Assistant Research Fellow**

Law Mo Yin Kris Ph.D City University of Hong Kong  
 sustainability development, technology management, technology and innovation entrepreneurship, engineering education

## COURSES

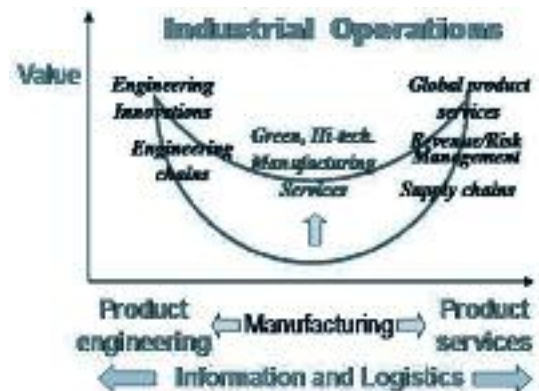
The institute offers a graduate program leading to the M.S. degree requirements include 25 credits of course work and thesis. At least 12 credits of the course work should be from courses offered by the institute and at least 6 credits should be from courses offered by other departments. An oral defense of thesis is required.

## ACADEMIC ACTIVITIES



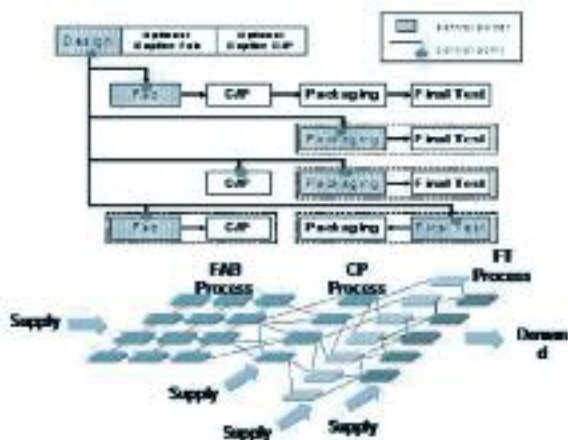
IIE has continued to develop the most advanced optimization and data mining technologies using artificial intelligence, soft computing, and mathematical and statistical analysis methods. All developed technologies are implemented in the stand-alone GUI software packages as shown in the figure. With appropriate consent, the software packages are available for download through the IIE website.

IIE is also developing new research areas, such as industrial analysis and service engineering. In particular, IIE has joined a collaboration effort by Colleges of EECS, Engineering and Management to propose an interdisciplinary research center. The center will focus its research on how to enhance the industrial added-value by integrating services, manufacturing, technologies and humanities (as shown in the figure).



IIE is renowned for its advanced research in semiconductor manufacturing systems. In particular, the research in demand planning and supply-chain monitoring and control of the semiconductor manufacturing network (as shown in the figure) has been funded by SRC and ISMI in the US.





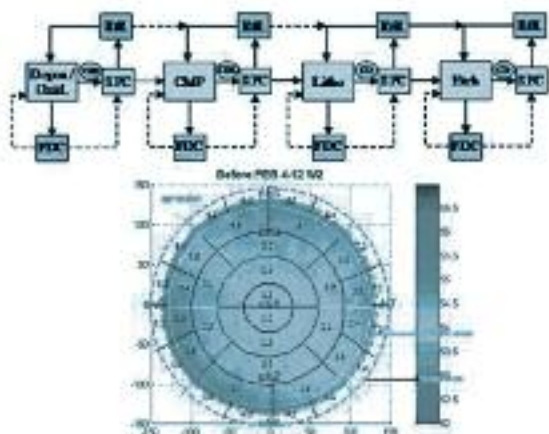
In addition to semiconductor manufacturing planning, IIE is also known for its research in advanced process/equipment control and engineering chain integration.

Besides co-op projects with domestic companies, there are also joint-development efforts with companies in the US and France. The research achievement has been internationally recognized.

sonography (as shown in the Figures.) In particular, IIE has collaborated with the Angiogenesis Research Center of NTU hospital to develop a computer-aided diagnosis system for thyroid cancers. IIE will continue its integrated research effort with the Medical School and the College of Life Sciences.

### CONTACT INFORMATION

Established in: 1994  
 Director: Argon Chen  
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 Website: <http://www.ie.ntu.edu.tw>  
 E-mail: [achen@ntu.edu.tw](mailto:achen@ntu.edu.tw)



Recently, IIE has extended its multidisciplinary research into biomedical research areas, such as analysis of gene expressions and clinical ultra-





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# 10. GRADUATE INSTITUTE OF BIOMEDICAL ENGINEERING

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## INTRODUCTION

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The Research Center of Biomedical Engineering was established in 1990, and changed into the Institute of Biomedical Engineering in 1998. This Institute belongs to both the College of Medicine and the College of Engineering. The Master Program was started in 1989 and the Ph.D. program in 1991. Biomedical engineering is an interdisciplinary program of biology-based engineering and problem-based learning. The students have from engineering, science, biology, and medicine backgrounds. Faculty specialties include biomaterials and tissue engineering, bioinformatics and image processing, bio-electronics, biomechanics, clinical engineering, and et al.



## FACULTY

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Full-time: 27

Part-time: 4

Ph.D.: 30

M.D.: 1

### Director/ Professor

Tai-Horng Yaung Ph. D., NTU

### Full-time

#### Professor

Yuan-Haun Lee Ph. D., Kyoto Univ.

Kuo-Huang Hsieh Ph. D., Detroit Univ.

Shuang-Shii Lian Dr. Ing., Technische Univ. Berlin

Jia-Yush Yen Ph. D., UC Berkeley

Jyh-Horng Chen Ph. D., UC Berkeley

Ching-Chuan Jiang M.D., Ph. D., NTU

Yi-You Huang Ph. D., NTU

Tai-Horng Young Ph. D., NTU

Sheng-Mou Hou M.D., Ph.D., NTU

Fong-Jou Hsieh M.D., NTU

Win-Li Lin Ph. D., Univ. of Arizona

Chung-Ming Chen Ph. D., Cornell Univ.

Jan-Min Wong M.D., Ph. D., NTU

Jui-Chang Tsai M.D., Ph. D., NTU

Shiming Lin Ph. D., University of Cambridge.

Chii-Wann Lin Ph. D., Case Western Reserve Univ.

Jaw-Lin Wang Ph. D., Ohio State Univ.

Tung-Wu Lu Ph. D., University of Oxford

Wen-Yih Tseng Ph.D., MIT

#### **Associate Professor**

Liang-Wey Chang Ph. D., Purdue Univ.

Fu-Shan Jaw Ph. D., NTU

Ming-Jium Shieh M.D., NTU  
Ph. D., Tokyo Woman Medical University

#### **Assistant Professor**

Fa-Hsuan Lin Ph. D., MIT, U.S.A.

Sung-Jan Lin M.D., Ph. D. NTU, R.O.C.

Pen-Hsiu Chao Ph. D., Columbia Univ.U.S.A.

Tzu-Ming Liu Ph. D., NTU

#### **Part-time**

#### **Professor**

Cheng-Yi Wang M.D., NTU.,Ph. D., Tokyo Woman Medical Univ.

Te-son Kuo Ph.D., Georgia Institute of Technology

#### **Associate Professor**

I-Jen Chiang Ph.D., NTU

Shwu-Pong Shieh Ph.D., University of Wisconsin, Madison

## **FACILITIES**

The Institute aims to promote teaching, research and development activities in biomedical engineering. Research projects are sponsored by various public and private agencies, including the National Science Council, Department of Health, National Health Research Institute, Industrial Technological Research Institute, and NTU Hospital etc. Research is conducted in the following areas:

1. Biomaterials: metal, ceramics, polymers, biological materials, and drug delivery systems. Developments are made in bioactive bone cement, bioglass ceramic and composite resin applied in orthopedic surgery and dental restoratives. Polymer research is focused on membrane technology for the improvement of kidney dialysis. Research on biological materials emphasizes tissue engineering and the related biomaterials. Applications include artificial pancreas, artificial cartilage, artificial skin, drug delivery mediators, etc. In addition, our research covers the application of various biomaterials in artificial organs and in drug delivery systems, as well.
2. Biomechanical Engineering: Research projects involve design and development of assistance devices for disabled and elderly people. The control group is also working on clinical investigation of computer control of anesthesia systems.
3. Clinical Engineering: The main goal is to carry

out and supervise quality medical care and to plan safety and risk of medical equipment. We hope to make sure that the use of medical equipment is legitimate.

4. Integrated Cardiac-Pulmonary Physiological Monitoring System: The system can connect each medical instrument by computer. Moreover, on the basis of integrated data, we can set up expert system to assist medical staff.
5. Hyperthermia Research : The research is divided into five parts: methods of ultra-sound heating design, fabrication, and evaluation of ultrasound transducers; control of ultrasound hyperthermia treatments; thermal modeling and treatment planning; clinical trials of ultrasound hyperthermia.
6. Optic Card System:the characteristics of large and undeletable memory are useful in building medical data systems and controlling insurance expenses.
7. Bioelectronics: Analog and digital circuit design and fabrication by PCB or integrated circuit processes.
8. Bioinstrumentation: Smart sensor system, Artificial neural networks for noninvasive blood glucose monitoring, Electro-physiological system, Automatic testing system for cardiac monitor, Ambulatory blood pressure monitoring system, Body surface mapping system.
9. Bioimage:Major research foci are on medical image reconstruction theory, medical image analysis, computer-assisted diagnosis and therapeutics, automatic ultrasound image segmentation and tissue characterization.

## COURSES

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Masters Degree Biomedical Engineering (3), Special Topics in Biomedical Engineering (4), Seminar in Biomedical Engineering( 4), Anatomical Physiology (For engineering graduates)(3)

## ACADEMIC ACTIVITIES

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We constantly hold academic seminars, lectures, and international symposia, including The 1st International Symposium held in May 1990, The 2nd International Symposium held in September 1992, The 1st Medical Engineering Week of the World held in September 1994, and The 3rd Asian-Pacific Conference on Medical & Biological Engineering held in May 1996. We also publish a scientific journal, the Journal of Biomedical Engineering, Applications, Basis, and Communications. This bimonthly journal has been accepted and included into the following famous databases: COMPENDEX (EI), INSPEC, EMA, Research Alert (ISI), Biomedical Engineering Citation Index(ISI), and EMBASE . Furthermore, the journal was evaluated by National Science Council as one of the excellent journals published in Taiwan.

## CONTACT INFORMATION

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Established in: 1998

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E-mail: [chimei@ntu.edu.tw](mailto:chimei@ntu.edu.tw)

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# 11. GRADUATE INSTITUTE OF POLYMER SCIENCE AND ENGINEERING

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## INTRODUCTION

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The Institute of Polymer Science and Engineering (IPSE) at the NTU is devoted to graduate teaching and research in polymer synthesis, characterization, morphology, rheology, physics, and engineering. IPSE's primary goals are to prepare skilled polymer scientists and engineers to fill the growing needs of industry, academia and government. At the same time, the institute pursues fundamental and applied polymer research to understand the basics of polymer materials and to expand the applications of polymers to human needs.

Over the past fifty years, the growth of polymer science and engineering has been extremely fast. With their processibility and high performance, polymers have become the material of choice of modern life from food packaging, clothing, housing, transportation, communication, to electronics and aerospace equipment, etc. Consequently, many departments at NTU have carried out extensive teaching and research programs on polymers for more than thirty years.

The founding of a graduate institute devoted to polymer science and engineering was advocated

from 1994. Finally, following the long-term efforts of the College of Engineering and the Department of Chemical Engineering, approval was obtained from the Education of Ministry in 2001 to set up an Institute of Polymer Science and Engineering for Ph.D. and M.S. level instruction and training. IPSE currently has 69 M.S. students and 60 Ph.D. students. At present, we have 5 full-time faculty, 22 co-junct faculties and 1 part-time faculty. IPSE will continue to seek and hire distinguished experts in the field of polymer science and engineering.

IPSE strives to maintain a state-of-the-art research environment and perform cutting-edge research programs sponsored by government and industry. The research directions and emphases are always in cutting-edge areas of polymer application:

1. Synthesis, morphology, and application of polymers for microelectronic and communication devices.
2. Design, synthesis, and application of polymer-inorganic hybrid materials
3. Design, synthesis, and application of advanced organic optical, electronic, and magnetic materials.
4. Design, synthesis, and application of biomaterials.

5. Preparation and characterization of smart polymer materials.
6. Synthesis and reaction mechanism of high performance polymers.
7. Preparation, structural analysis, and processing principle of high performance composite materials.
8. Numerical modeling of polymerization, structural formation, and process control of polymers.
9. Rheology and thermodynamics of polymers and polymer blends.
10. Molecular modeling and polymer interface science and technology.



## FACULTY

Full time: 5

Cojunct faculty: 22

Part time: 1

Ph.D. Degree: 28

### Director/ Professor

Wen-Chang Chen Ph.D. University of Rochester

### Full-Time

#### Professor

Jiang-Jen Lin Ph.D. Georgia institute of Technology

Guey-Sheng Liou Ph.D. Tokyo Inst. Technology

Ching-I Huang Ph.D. Northwestern University, U.S.A.

Shan-Hui Hsu Ph.D. Case Western Reserve University

#### Assistant Professor

Shih-Huang Tang Ph.D. University of Maryland

### Adjunct

#### Professor

Chao-Hsun Chen Ph.D. University of Illinois

Li-Jen Chen Ph.D. Rice University

Wen-Chang Chen Ph.D. University of Rochester

Yan-Ping Chen Ph.D. Rice University

Wen-Yen Chiu Ph.D. National Taiwan University

Kuo-Chuan Ho Ph.D. University of Rochester

Kuo-Huang Hsieh Ph.D. University of Detroit

Jyh-Ping Hsu Ph.D. Kansas State University

Keh-Chyang Lee Ph.D. University of Washington Seattle

Man-Kit Leung Ph.D. University of Iowa



Wen-Bin Liao	Ph.D. University of Utah
Chun-Pin Lin	Ph.D. University of Minnesota
King-Fu Lin	Ph.D. Polytechnic University of New York
Tien-Yau Luh	Ph.D. University of Chicago
Wei-Fang Su	Ph.D. University of Massa- chusetts
Yu-Jane Sheng	Ph.D. Cornell University
Da-Ming Wang	Ph.D. Pennsylvania State University
Lee-Yih Wang	Ph.D. Chemistry, University of Minnesota
Shi-Chern Yen	Ph.D. University of Wisconsin-Madison
Tai-Horng Young	Ph.D. National Taiwan University

**Associate Professor**

Chi-An Dai Ph.D. Cornell University

**Assistant Professor**

Feng-Yu Tsai Ph.D. University of Rochester

**Part-Time****Professor**

Leo-Wang Chen Ph.D. University of Tokyo

**FACILITIES**

IPSE is located in the building previously named the National Institute for Compilation and Translation, occupying an area of approximately 1500 square meters, with one administrative office, two classrooms, two conference rooms and several laboratories. We are continuing to seek more space and resources to house the increasingly numerous faculties, students and facilitate cutting-edged research.

**COURSES****Required courses****Thesis, Subject research**

Elective/Required courses:

**MS:**

Advanced Polymer Chemistry, Polymer Physics, Seminar.

MS students need to select three courses from the following list, respectively.

Functional Polymers, Polymer Physical Chemistry, Polymer Physics I: Solid State Physics, Polymer Characterization, Polymer Morphology, Fundamentals and Applications of Polymer Processing.

**Ph.D:****Seminar.**

A. Chemistry (at less 2 courses): Advanced Polymer Chemistry, Functional Polymers, Special Topics in Polymer.

- B. Physics (at less 2 courses): Polymer Morphology, Polymer Physics I: Solid State Physics, Polymer Physical Chemistry.
- C. Characterization and Others (at less 1 courses): Polymer Characterization, Fundamentals and Applications of Polymer Processing.

### **Requirements for the M.S. Program**

The M.S. students fulfill the following requirements to be awarded the M.S. degree:

1. 25 credits are required from elective courses. (Approval is required for courses taken outside the institute.)

### **Requirements for the Ph.D. Program**

Ph.D. students must fulfill the following requirements to be awarded a Ph.D. degree:

1. 24 credits are required from among the elective courses. (Advisor's approval is required for courses taken outside the institute.)
2. The candidate is required to pass the qualifying examination by the end of second year.
3. The candidate is required to publish scientific papers with total SCI impact factor equal or higher than 3.0.

## **ACADEMIC ACTIVITIES**

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We organize conferences on polymer materials and offer seminars and training courses for academia, industry, government and the general public on a regular basis to expand our education base and outreach.

## **CONTACT INFORMATION**

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Established in: 2002

Director: Wen-Chang Chen

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Fax: +886-2-33665237

Website: <http://www.pse.ntu.edu.tw>

E-mail: [ntuipse@ntu.edu.tw](mailto:ntuipse@ntu.edu.tw)

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# 12. YEN TJING LING INDUSTRIAL RESEARCH INSTITUTE

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## INTRODUCTION

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Tjing Ling Industrial Research Institute (TLIRI) was established in March 1975 under a contract signed by NTU and Yen Tjing Ling Industrial Development Foundation, for the purpose of engaging in engineering technology R&D, thus promoting cooperation between industry and the university to facilitate national economic growth and infrastructure development.

TLIRI building is located at No. 130, Section 3, Keelung Road, on the NTU campus. The building was donated by the Yen Tjing Ling Foundation and has operated from March 1977.

TLIRI is a nonprofit research organization in the NTU College of Engineering. The Institute's operating expenses are generated from the service overhead. The Foundation also sponsors annual research grants on project base. TLIRI shares its service overhead with the University as feedback.

## ORGANIZATION

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The TLIRI supervisory council reviews the Institute's development goals, activity plans and expenditure budget for TLIRI, and monitors its performance and results. The dean of the College of Engineering is the chief commissioner of the council, and the dean of the College of Electrical Engineering and Computer Science is the vice-chairman of the council. The director and deputy-director of TLIRI are appointed from College of Engineering faculty .

## MAJOR TASKS

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TLIRI is a bridge between the University and outside organizations, including industrial enterprises, government bodies and research units. TLIRI activities fall mainly into the categories of entrusted and cooperative research, professional training, industrial testing and international conference servicing, etc.

### 1.Prospective technology development

Yen Tjing Ling Industrial Development Foundation sponsors research projects aimed at enhancing industrial technology. Project results are transferred to related industries to enhance their technology or facilitate their new product development.

### 2.Cooperative research between industry and university

TLIRI is familiar with the R&D resource and expertise of the College of Engineering, the College of Electrical Engineering and Computer Science, and related colleges at NTU. TLIRI also has ample professional service experience for managing cooperation between industry and university. Embracing the win-win approach, TLIRI provides ever-improving service for medium and administration management.

Agencies that entrust research cooperation include government units, the military, national businesses, corporate foundations, private enterprises, etc.

### 3.Extension education and training

To cultivate talent and provide on-the-job training for the military, the government and private enterprise, TLIRI also plans hi-tech integrated training programs and appoints foreign and local professionals to train various manpower in the latest technology and processes.

The categories of training courses conducted by TLIRI include the following:

- (1) Expert environmental protection training for the Environment Protection Administration
- (2) Civil aeronautics pilot training for the Civil Aeronautics Administration
- (3) Short-term professional supplemental training for post-masters talents for the National Youth Commission
- (4) 2nd grade specialized training (including employment guide) of technicians for new industries
- (5) On-the-job training of qualified instructors for every employment & vocational training center of the Bureau of Employment & Vocational Training
- (6) Wireless communication industry talent training for Industrial Development Bureau, Ministry of Economics Affairs
- (7) Enterprise university (master class) & on-the-job advanced talent training for enterprises
- (8) On-the-job advanced training of industrial technology labor for the Bureau of Employment & Vocational Training
- (9) Electronics talent training for Construction and Planning Administration, Ministry of the Interior
- (10) Talent training in application technology on special chemical production for the Industrial Development Bureau, Ministry of Economic Affairs

(11) Talent training in semiconductor technology for the Industrial Development Bureau, Ministry of Economic Affairs: Semi-Conductor Academy & Digital Content Academy

(12) Talent training of computer and information software and core capability for the Council of Labor Affairs, Executive Yuan

(13) Program of industry talent training for the Bureau of Employment and Vocational Training

#### 4. Industrial technology service

TLIRI operates more than 70 laboratories under the research factory system of the College of Engineering and the College of Electrical Engineering and Computer Science at NTU. These laboratories provide various technology services and equipment resources, and offer technical consulting, analysis and test services for industry and university.

The fields of technology service include chemical engineering, civil engineering, environmental engineering, hydro engineering, stress testing, naval architecture and ocean engineering, electrical engineering, computer science and information engineering, electro-optical engineering mechanics and materials engineering, biomedical engineering, etc.

#### 5. International conference service

Since August 2000, TLIRI was officially assigned by the NTU president, Prof. Chen Wei-Chao, to be

the sole service unit in charge of providing logistical assistance to NTU faculty members holding international academic conferences. It provides the following services to help the organization offer and international quality conference and image:

- (1) Coordination and Management
- (2) Call-for-Paper and Review Processing (in Coordination with Technical Committee)
- (3) Printing, Publication and Publicizing
- (4) Banquet, Accommodation and Spouse Program
- (5) Finance & Accounting Operation
- (6) Exhibition
- (7) Technical Visits & Sight-seeing
- (8) Transportation & Special Airport Pick-Up Service
- (9) Registration
- (10) Program Flow Control
- (11) Conference Site Planning
- (12) Conference Management System

## CONTACT INFORMATION

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# 13. HYDROTECH RESEARCH INSTITUTE

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## INTRODUCTION

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The Hydrotech Research Institute (HRI) is affiliated with the College of Engineering and the College of Bio-Resources and Agriculture at NTU. HRI evolved from the Taipei Hydraulic Research Laboratory, which was first jointly managed by the NTU and the Ministry of Economic Affairs from 1950 to 1961. After 1961, the Laboratory came under the sole proprietorship of the University, and was known as HRI.

## OBJECTIVES

The objectives of HRI include the following: assist graduate and undergraduate teaching; conduct hydraulic and fluid-mechanic experiments; pursue hydraulic modeling studies -- physical, numerical, and analytical; perform academic research in water issues, particularly those related to Taiwan; and provide continuing education and extension service.

## ACHIEVEMENTS

### 1. Teaching and Research

(1) Four classes of fluid-mechanics experiments are held at HRI each year for students of the Departments of Civil Engineering and Bioenvironmental Systems Engineering. In addition,

the graduate students of Civil Engineering also use the facilities to conducting intermediate fluid-mechanics experiments. In recent years, approximately 160 students use its facilities annually.

- (2) HRI also provides graduate students with facilities for conducting research work. Several tens of master and doctoral theses depended on HRI facilities for their completion.
- (3) In the past three years, HRI has facilitated over 100 basic research projects, with main topics including:
- Hydraulics
  - Hydraulic structures
  - Sediment transport
  - Hydrology
  - Fluid Dynamics
  - Disaster prevention
  - Multidisciplinary areas

### 2. Extension Services

- (1) Development of simulation models:
- For hydraulic analysis: Models for unsteady river/estuary flows in channel network and in 2-D water bodies.
  - For sediment transport: Alluvial channel, sediment transport, reservoir sedimentation models.
  - For Hydrologic analysis: Rainfall frequency analysis; catchment hydrology models.



- For drainage analysis: 2-D flood inundation model, drainage system model, etc.

(2) Completion of sponsored projects: Over the years, the HRI has executed and completed about 300 projects sponsored by government agencies and private sectors.

(3) Workshops/Seminars:

- Open-channel hydraulics
- Flood routing in river channels
- Hydrologic analysis
- Reservoir operation
- Water-quality modeling

## FUTUR PROJECTS

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### **Instructional:**

1. Addition of educational video tapes for fluid mechanics experiments.
2. Promotion of computer-aided experiments, teaching and project execution.
3. Strengthening the intermediate fluid mechanics experiments.

### **Research:**

1. Experimental research: With laser doppler velocimetry and imagery processing equipment, precision experiments can be conducted in various research areas.
2. Numerical modeling: Given the past achievements in numerical modeling, and the fast-advancing computer science and technology in Taiwan, the future outlook of research by numerical modeling appears very bright.

### **Extension Services:**

1. Hydraulic analysis: Focus on promotion, use and development of numerical models for analysis of the critical problems that will confront Taiwan in the future, such as reservoir sedimentation, river channel stability, flood forecasting analysis, flow and sediment measurements and debris flow, etc.
2. Hydrologic analysis: Demand is increasing for dissemination of hydrologic analysis models for use in organizing and classifying hydrologic data in Taiwan, and for hydraulic engineering planning, design and operation.

3. Water resources system analysis: Increasing promotion and use of up-to-date techniques for water-resources system analysis to assist decision making in problems, such as water distribution, reservoir operation, etc., in accordance with the state of water-resources deficiency and ill-distribution in Taiwan.
4. Compilation of water resource problems: Compilation of information and data concerning water-resources problems of Taiwan, including social, economical, institutional, legal, and etc., will be carried out. Such information and data compilation may lead to schemes and measures for solving these problems and to suggestions for government decision-making.

#### Cooperation:

To promote cooperation with internationally renowned institutes for technical information exchange, arrangements are made from time to time to invite scholars and specialists world wide to the HRI for collaborative research and/or lectures.

## FACULTY

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Senior Research Fellow : 25

Associate Research Fellow : 3

Research Engineer : 5

Ph.D. : 30

M.S. : 3

### Director

Liang-Hsiung Huang Ph.D., University of Iowa

#### Senior Research Fellow

Ru-Yih Wang Ph.D., Kyoto University

Chin-Lien Yen Ph.D., University of Iowa

Der-Liang Young Ph.D., Cornell University

Ming-Hsi Hsu Ph.D., National Taiwan University

Gwo-Fong Lin Ph.D., University of Pittsburgh

Hung-Pin Huang Ph.D., University of Iowa

Hong-Yuan Lee Ph.D., University of Iowa

Fi-John Chang Ph.D., Purdue University

Yih-Chi Tan Ph.D., Cornell University

Ke-Sheng Cheng Ph.D., University of Florida

Ko-Fei Liu Ph.D., M.I.T

Jen-Chen Fan Ph.D., Purdue University

Chen-Wuing Liu Ph.D., UC Berkeley

Ting-Kuei Tsay Ph.D., Cornell University

Ming-Daw Su Ph.D., Utah State University

V. Chintu Lai Ph.D., University of Michigan

Fu-Chun Wu Ph.D., UC Berkeley

Jong-Dao Jou Ph.D., University of Washington

Chia-Chi Sung Ph.D., Pennsylvania State University

Tsang-Jung Chang Ph.D., University of Illinois

Nien-Shen Hsu Ph.D., UCLA

Herv'e Capart Ph.D., Université catholique de Louvain

Yu-Pin Lin Ph.D., Georgia Institute of Technology

Jihn-Sung Lai Ph.D., UC Berkeley

#### **Associate Research Fellow**

Wen-Shyang Hou Ph.D., Tokyo University

Tim-Hau Lee Ph.D., University of Iowa

Cheng-I Hsieh Ph.D., Duke University

#### **Research Engineer**

Ming-Jen Chen Ph.D., National Taiwan University

Wen-Sheng Lin Ph.D., National Taiwan University

Chen-Ho Chien M.S., National Taiwan University

Cheng-Yu Ho M.S., National Taiwan University of Science and Technology

Gwo-Wen Hwang M.S., National Cheng Kung University

## **FACILITY**

### **Teaching Facilities**

1. Experimental facilities for basic fluid-mechanics courses.
2. Experimental facilities for the intermediate fluid-mechanics course:
  - Apparatus for surge and water hammer
  - Wind tunnel
  - Seepage apparatus
  - Cavitation apparatus
 Other items are also provided for graduate students.
3. Audio-Visual Equipment.

### **Library**

The HRI library is a literature/data repository for water science and engineering. Currently it holds over 3,000 volumes of books and articles, approximately 4,500 reports (of which about 450 were published by HRI), more than 400 Ph.D./M.S. theses, and other reference materials.

### **Computing Facilities**

#### **Hardware**

1. Network system.
2. Personal computers: HRI presently has over 60 and higher class PCs.
3. Satellite display system.
4. Global positioning system.

#### **Software**

1. Geographical information system: ARC/INFO.
2. Interactive virtual reality softwares.

### 3. Computer system.

- Sets of HRI-staff-developed computer software and numerical models.

Experimental sites, flumes, and equipment Sites HRI is located on the main campus of the university, facing Chow-Shan Road, and consists of a four-story main building, an old annex building, and outdoor experimental grounds. The main building has ground space of about 4,000 square, filled with a fluid-mechanics classroom, an audio-visual classroom, library, office, etc.

- The annex building occupies 800 square meters to house indoor experimental grounds, including an inlet testing setup, a debris-flow experimental quarter, a density-current experimental sector, a recirculation flume, and some office space. Adjoining the two buildings are four outdoor segments of experimental grounds: a velocity-meter calibration flume, east experimental area, west experimental area, and a channel-bend experiment court.

Since 1997, two off campus outdoor units were established to provide more facilities for physical modeling.

### Flumes

There are 11 flumes in HRI;

1. The Large Flume: Adjustable slope, suitable for experiments on fixed-bed as well as movable-bed channel flows.
2. The High-precision Flume: Adjustable slope, available for use with laser doppler measurements.
3. Other Flumes: Nine other flumes are available for specific studies such as high-velocity flow,

density-stratified flow, sediment transport, waves, etc.

### Instrumentation

1. Precision measurement instruments, including 2-D laser doppler velocimeter, laser sheet and image processor.
2. There are more than 100 instruments for general use in hydraulic laboratory work.

## MAIN FUNCTIONS

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### Aids in Teaching

1. To compile and enhance teaching materials for the undergraduate and graduate curricula.
2. To upgrade the facilities for laboratory courses and update the visual-aid system for experiments by which to enhance teaching quality.
3. To improve experimental facilities and research environments for the research work associated with theses of graduate students.

### Extension Services

1. Hydraulic analyses: Hydromechanic analyses of hydraulic structures, river mechanics, movable-bed flow computation, and flood inundation simulation.
2. Physical model tests: Hydraulic structure, river engineering, dam engineering, reservoir sedimentation, surface runoff, surface erosion, debris flow, and so forth.
3. Hydrologic analyses: Precipitation-data analysis, rainfall-runoff simulation, hydrologic monitoring system, and the like.

4. Water resources system analyses: Reservoir operation, conjunctive use of surface and ground water, watershed management, hydrologic information system, and the like.
5. Numerical model developments: Numerical methods and analyses, programming aspect of model development, engineering aspect of model development, prototype modeling and simulation, unsteady-flow modeling, development of forecasting systems, advanced modeling techniques, etc.
6. Virtual Reality Technology:

To increase the efficiency of communication among designers, decision makers and the public, the useful 3D/VR (virtual reality) techniques are used to generate interactive scenes, which create delicate 3D models such as buildings, levees, river flow, topography, etc. Through internet, the applications of 3D/VR techniques systems become important tools for display the results by simulation or experiment. Some of the applications are related to the Keelung river flood mitigation project such as Yuanshanzi flood diversion and levee construction with eco-engineering concept.

## ACADEMIC RESEARCH

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1. To steer, in view of the inherent characteristics prevailing in the hydraulics of Taiwan, research directions toward such areas as: (1) river hydraulics, (2) hydromechanics of hydraulic structures, (3) reservoir sedimentation, and (4) hydrologic/stream forecasting.
2. To promote scholarly exchange and cooperation with international hydraulic laboratories.
3. To sponsor symposia, conferences, lecture series, seminars, and workshops.

## CONTACT INFORMATION

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# 14. CENTER OF EARTHQUAKE RESEARCH

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## INTRODUCTION

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The Center for Earthquake Engineering Research (CEER) was established in January 1978 as a research unit under the College of Engineering. The Center's missions are carried out under the Supervisory Committee on which the Dean of the College of Engineering, Prof. Huan-Jang Keh serves as the Chairman. Committee members include the Heads of the Graduate Institute of Civil Engineering, Mechanical Engineering, Naval Architecture, Applied Mechanics as well as several outstanding specialists and scholars in related areas. Professor S.J. Hwang of the Civil Engineering Department has been the director of the center since August 2009.



## RESEARCH AIMS

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1. Carry out basic and applied research on earthquake engineering.
2. Promote technologies on resistant design and analysis.
3. Collect, compile and distribute technical information about earthquake engineering.
4. Carry out reconnaissance of earthquake disasters.
5. Promote academic activities concerning earthquake engineering.
6. Carry out research coordinated by the National Center for Research on Earthquake Engineering.



## ORGANIZATION

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Facilities Supporting CEER for Earthquake Engineering Research:

1. Ambient vibration measuring system.
2. Dynamic soil resonant column test system.
3. Cyclic soil dynamic triaxial test system.
4. Pseudo dynamic structural test system.
5. Acceleration transducer measuring and recording system.
6. More than twenty sets of SMA strong motion accelerographs.
7. More than one thousand volumes of reference books and research reports.
8. Actuators and Reaction Systems.

## CURRENT ACTIVITIES

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1. Science & Technology Researches on Natural Disaster: Planning and Promotion on Earthquake Engineering and Seismology Research Field
2. The Study on Strategy of Seismic Design and Retrofit of Scoured Bridges for Minimum Cost (II)
3. Materials and Design Parameters of High Strength Concrete for Taiwan New RC project
4. Design and Integration of Wireless Sensing System with Structural Control and Health Monitoring (II)
5. Smart Ventilation for Superior Living Environment (3/3)
6. Develop Structural Health Monitoring and Early Warning Damage Detection System for Bridge Structures Using Smart Sensing Network (II)
7. Seismic Upgrading of School Buildings in Taiwan (1/4)



## FUTURE PROJECTS

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1. Design and Integration of Wireless Sensing System with Structural Control and Health Monitoring (III)
2. Science & Technology Researches on Natural Disaster: Planning and Promotion (III)
3. Develop Structural Health Monitoring and Early Warning Damage Detection System for Bridge Structures Using Smart Sensing Network (III)
4. The Study on Strategy of Seismic Design and Retrofit of Scoured Bridges for Minimum Cost (III)
5. Study on the Collapse Behavior of Reinforced Concrete Vertical Elements Subjected to Cyclic Loading
6. Seismic Upgrading of School Buildings in Taiwan (2/4)
7. Research and Promotion of the Reinforced Concrete Structures using High Strength Materials

## CONTACT INFORMATION

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Established in: 1978

Director: Shyh-Jiann Hwang

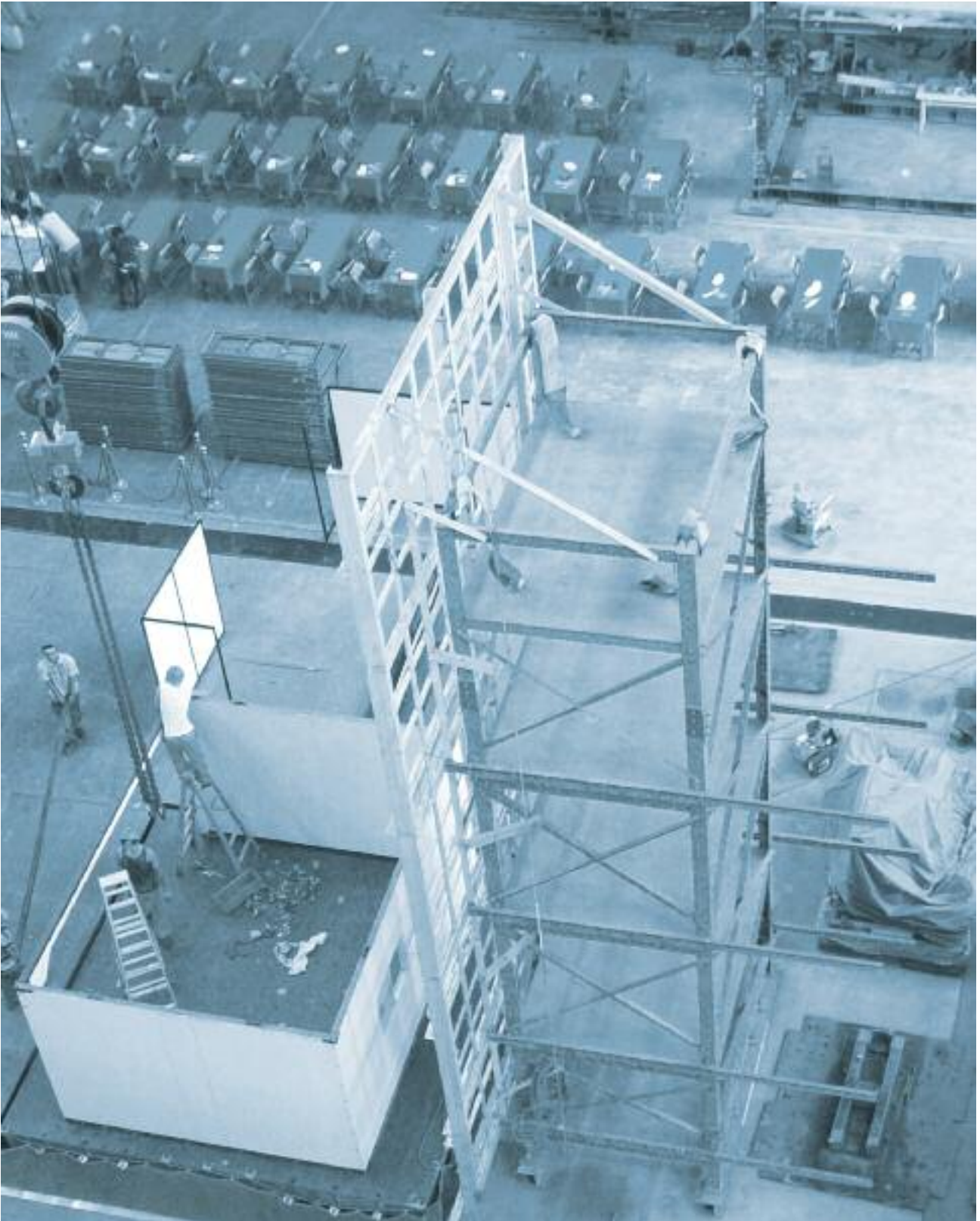
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# 15. PETROCHEMICAL INDUSTRY RESEARCH CENTER

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## INTRODUCTION

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The Research Center for Petrochemical Industry was established in November 1997 as an independent research unit under the College of Engineering. The petrochemical industry is important to the economic progress in Taiwan. Research for improving manufacturing processes for cleaner production, energy conservation and pollution prevention are the main objectives of this research center.

Policies of this research center are set by a steering committee, of which the Dean of Engineering serves as the chairman. The director of this research center, nominated by the Dean of the College of Engineering and appointed by the NTU President, is responsible for the operations under the steering committee. This research center is closely related with the Department of Chemical Engineering and other units at NTU.

## RESEARCH AIMS

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1. Cooperate with other units at NTU for integrated researches and establish a consulting team for industrial development.
2. Establish experimental laboratories and computation facilities for petrochemical related researches.
3. Promote basic and applied researches for petrochemical and related industries and train and educate future human resources.
4. Collaborate with domestic and foreign research institutes and supply information for future energy policy.

## CURRENT ACTIVITIES

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### 1.Process Simulation and Design

- (1) Computer aided process simulation and design
- (2) Process synthesis and integration
- (3) Improvement and evaluation of design software

### 2.Physical Properties and Thermodynamics

- (1) Phase equilibrium experiments and calculations
- (2) Molecular simulation and product design
- (3) Thermodynamic data-bases
- (4) Development of equations of state

(5) Phase equilibria at high pressures

### **3.Catalysis and Reaction Engineering**

- (1) Development of Catalysts
- (2) Reactions of hydrocarbon mixtures
- (3) Catalytic membrane reactors
- (4) Simulation of chemical reaction systems
- (5) Fluidization engineering

### **4.Process System Engineering**

- (1) Process control and optimization
- (2) Feasibility of industrial processes
- (3) Dynamic simulation
- (4) Neural network and fuzzy control

### **5. Separation Technology**

- (1) Fluid transport and unit operations
- (2) Heat and mass transfer
- (3) Supercritical fluid extraction
- (4) Bioseparation technology
- (5) Inorganic membrane separation
- (6) Surface science and electrochemical engineering

### **6.Environmental Protection**

- (1) Waste treatment technology
- (2) Resource utilization
- (3) Industrial safety
- (4) Cleaner production processes

### **7.Energy Policy and Technology**

- (1) Energy saving separation processes
- (2) Biomass utilization
- (3) Energy policy and economic evaluation
- (4) Nano materials for Energy storage

### **8.Polymer Engineering**

- (1) Physical properties of polymers
- (2) Polymer reaction engineering

(3) Polymer materials

- (4) Molecular simulation on polymer systems
- (5) Process engineering for polymer systems

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## **CONTACT INFORMATION**

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Established in: 1997

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# 16. INDUSTRIAL KNOWLEDGE TECHNOLOGY RESEARCH CENTER (IKTRC)

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## INTRODUCTION

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The Industrial Knowledge Technology Research Center (IKTRC) of National Taiwan University was established out of the ashes of its predecessor, the Center of Excellence for Research in Computer Systems (CERICS), in February 2002, to be an independent research unit under the College of Engineering. The objectives of the Center are to coordinate and consolidate research efforts and expertise in Knowledge Technology and Electronic Business among different departments in the College of Engineering, and to interact with related local industries to promote their use of cutting-edge applications of Knowledge Technology and Electronic Business.

The highest governing body of IKTRC is the Supervisory Committee. Committee members are nominated by the Dean of the College of Engineering and appointed by the President of the University. The Dean of the College of Engineering is also the chairman of the Supervisory Committee. The Director of IKTRC, also appointed by the Dean, is responsible for the actual operations of the Center. The current Director is Professor Tung-Han Chuang of the Department of Materials Science and Engineering.

## GOALS

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### 1.Applications of Electronic Technologies

- (1) Knowledge-Based System
- (2) Product Data Management (PDM)
- (3) e-Marketplace
- (4) Interactive Electronic Technical Menu (IETM)

### 2.Knowledge Management

With the coming of Knowledge Economy Age, the competitiveness of an enterprise or a country is no longer only a function of its material resources. Recently, the importance of Intellectual Property rights has been emphasized, and this affects the competitiveness of an enterprise or even a country. Therefore, effective and secure knowledge management is a topic of crucial importance today.

### 3.Patent Information Analysis

To analyze intellectual property, we have to analyze patents or research papers. According to the report of WIPO, patent documents cover 90%~95% of the research in the world, and if we took advantage of it, while doing research, we could save much time and capital. Therefore, when doing research or intellectual property analyses, it is important to analyze the Patent Information.

The center has developed the newest technology In building a dynamic search index for the search and analysis of patent technology in order to master the R&D movements of various enterprises within the domain of technology, and assist these enterprises in terms of strategic planning for R&D. Such technical research enhances the ability to apply for patents successfully. Regarding any particular technological theme and domain search, the developmental direction of the key technology must be mastered to prevent infringements of other companies' rights during patent application, as well as to provide assistance In drafting the overall arrangement and maintenance strategy of the patent technology. Regarding structured analyses of patents, efforts shall be devoted to quality patent analysis and the R&D capacity analysis of inventors, patent holders and the entire country within the technical domain. As to analysis of a particular technical theme, in addition to the above technical analyses, the analysis on movements within the technical domain of R&D and technological development predictions are also undertaken, which shall include technical property analyses on the cycle and effectiveness of the technology, as well as strategic analyses on the R&D direction and technology arrangements.

#### **4.Industry and Technology**

##### **Development Tendency Analysis**

By analyzing intellectual documents like patents, we not only get the technical information but also learn about recent developments of industry and technology.

For effective utilization of industrial and technical trend analyses, the center discusses and analyzes the patent number growth in the industrial and technical domain, and cooperates with the current technical development status of various industries to propose the prediction for future developmental directions, industry and market movements, and future economic prosperity. Industrial competitive analysis will lead to transfer of authorized analyses of the patent technology and vertical/horizontal analyses of the R&D. As to competitive analyses of national industrial technology development, the objectives will be focused on the current status and global trend predictions of our national industrial patent technology, development condition and global competitive analyses in the industrial regions, as well as national technology development ability and competitive analyses.



## CURRENT ACTIVITIES

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The center is responsible for the arrangement of short courses for on-the-job training.

### Such courses include

1. Applications of Electronic Technologies
2. Knowledge Management skill training
3. Patent search and patent analysis skills
4. Seminar of Industry and Technology Development Tendency Analysis

### Academy-Industry Link

For vocational training in Knowledge Management, the relationship of the center to industry is linked through the following units of the government.

1. Employment and Vocational Training Administration
2. National Youth Commission
3. Institute For Information Industry

## FUTURE PROSPECTS

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1. Continue to win over the financial support for vocational training in knowledge management, to educate high-level and skilled manpower and to cover demand in this field.
2. Be in tune with "Program for Promotion of E-Business and Automation of Industries", draw up suitable research plan according to the manpower and facilities in the College of Engineering to compete for participations in consulting service of EB.
3. Search for proper enterprises, by acting in concert with the reward program provided by the Government, to introduce EB into business operations and increase its effects, so that a tough cooperation between industries and universities can be built up.

## CONTACT INFORMATION

---

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# 17. NANO-ELECTRO-MECHANICAL SYSTEM RESEARCH CENTER (NEMSRC)

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## INTRODUCTION

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The mission of the Nano Electro Mechanical System (NEMS) Research Center is to cultivate talents and basic technologies in micro and nano electro mechanical systems to promote the country's industrial development. Simultaneously, the research center is working on cultivation of talents, R&D and integration of technologies and promotion of industrial development.

NEMS's operation team stresses cultivating innovative talents and technologies in the micro nano electromechanical fields so as to spur Taiwan's development and competitiveness. Their strategies for success include:

1. Create mutual trust mechanisms and recognition through bi-directional communication and to jointly draw up the organization strategy and departments to ensure stable long-term operations.
2. Maintain high-standard research environment and culture to encourage researchers in each institute and department to participate enthusiastically and work diligently.

3. Coordinate integrated cross-institute / Interdisciplinary research talents and facilities to carry out large-scale research and talent cultivation.
4. Enhance cooperation with industry in order to sustain development of the Center.

With a total area of 300 square meters, the Center is located at the Institute of Applied Mechanics, and generally divided into administration offices, lithography room, testing room, etching room, furnace room and facility rooms. Also, a system design room, with an area of 36 square meters, is set up at the Department of Mechanical Engineering. The total capital investment so far exceeds NT 200 million dollars. To ensure that the open laboratory system enables all faculty, students and staff members to make good use of the center laboratory facilities, NEMS's laboratory operation management stresses four key issues, safety, environmental protection, quality and service:

1. Safety: Operation management personnel and all laboratory users must be qualified with training in industrial safety and sanitation and hazardous chemical substance handling.
2. Environmental Protection: A variety of liquid waste and disposal recycling process equipment has been installed to meet environmental protection regulations and prevent biohazards from entering the campus environment.

3. Quality: All laboratory management procedures and documents are drawn up in accordance with ISO 9000 standards and announced on the center's website: <http://nems.ntu.edu.tw>.
4. Service: Several computer networks and online technical databases are in operation and reservation systems for equipment application and educational training networks are also available.

## RESEARCH OBJECTIVES

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The research center strives to facilitate and undertake system integration and basic process technology research. The role that each institute and department plays is to have vertical work-sharing, develop relevant professional technologies and carry out lateral integration through various key industrial development plans, such as information, communication, semiconductor, automation and biomedicine. In the seven years since the establishment of the Research Center, it has joined many universities, colleges, research institutes and industries together to involve them in research in micro electromechanical systems, and has obtained three worldwide patent rights.

## CURRENT ACTIVITIES

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The center plans a series of educational training courses and special subjects to provide academics and industrial technicians with complete profes-

sional training. The current educational training includes credit courses, basic technological training courses, industrial safety and sanitary training courses, equipment training courses, factory training courses and factory special subjects. More than 4,200 students are taking these professional training courses and special subjects provided by the center; more than 4,000 students have qualified for general operation of the center's laboratory and 3,200 students have qualified for operation of partial equipment and facilities.

## UNIVERSITY-INDUSTRY LINK

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In developing the micro electromechanical industry and the sustainable operation of the center, cooperation between industry and university include technological services and cooperative technological development. As for technological services, the center provides on-site technological training (e.g., Hsin-Chu Enterprise and Taiwan Si-Wei Electronic Company). In addition, the center develops technologies and applies for patent rights together with industry.

So far, negotiated joint developments include back-light baffle and polarized transformer of LCD monitor, surface acoustic wave (SAW) device, temperature and pressure sensors in a mold and integrated microwave passive device.

## FUTURE PROSPECTS

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Future R&D activities will be focused on nanotechnology. A long-term R&D project for 2002~2017 was drawn up, which can be divided into three phases. In the first phase (2002~2006), nano-manipulation technique and lab-on-a-chip for bio-diagnosis will be the major R&D focus. In the second phase (2007~2011), embedded wireless bio-diagnosis systems will be the major R&D focus. To overcome the miniaturized system requirement, the COMS compatible process for miniaturized RF-module and the bio-compatible material for in-vivo will be developed. In the third phase (2008~2011), swallowed biomedical diagnostic and therapy system is our objective. The focal efforts include:

1. Nano chemical thin film
2. Nano bio thin film
3. Nano metrology for biochip
4. Nano mechanics of the thin film of biochip
5. Nano chemical dynamics of the thin film of biochip
6. Laboratory testing of biochip

As to operation management, in order to utilize the Center research resources effectively, develop the process technological margin, ensure high-quality R&D and speed up the talent cultivation, key points in future planning are:

1. Micro/nano electromechanical technologies,
2. Database of standard technologies,

3. Common teaching materials for network version micro/nano electromechanical system.

In its future development, the Research Center will be the crucial bridge between university and industry to promote innovative research and a window for technological exchange of micro/nano electromechanical systems around the world in hopes of making Taiwan one of the world leaders in micro/nano electromechanics

## CONTACT INFORMATION

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# 18. MANUFACTURING AUTOMATION TECHNOLOGY RESEARCH CENTER (MATRC)

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## INTRODUCTION

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The research on manufacturing automation in College of Engineering at NTU can be traced back to 1986. In 1989, the college established the group of Computer-Integrated Manufacturing, which has developed the first set of Flexible Manufacturing System for education in the whole country. In February, 1996, the Manufacturing Automation Technology Research Center (MATRC) was established. The former task of the center was developing manufacturing automation technology and training relevant skilled manpower. Recently, the task has been turned into promoting the efficiency, precision, reliability, and stability of machines by developing system intelligence and manufacturing precision. Further the development of software, sensors, measurement, on-line control and intelligence control technology will be the core. In order to upgrade the technology of domestic industrial circle, the center has been integrated with the relevant researched corporation to develop high value productions and technology.

## OBJECTIVE

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1. To develop the Hi-Tech of manufacturing intelligence and precision, and to train relevant skilled manpower.
2. Cooperate to the national policy and the academic object of NTU, and develop manufacturing intelligence system and precision machining technology in order to upgrade the technology of domestic industrial circle and train relevant skilled manpower.
3. Integrate the research in manufacture intelligent at NTU, and proceed to the foresight and practical utility of manufacturing intelligence, and offer consultation to the government when they need to work out relevant policy.
4. Cooperate with other departments at NTU and research exhaustively into the influence of manufacturing intelligence technology on society, economy, culture and engineering ethics in order to offer the government to consult.

## ORGANIZATION

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The MATRC establishes the Ultra Precision Machining Factory and the Precision Machining Lab, and integrates the Traditional and Non-traditional Machining Lab, the Computer-Integrated Manufacturing Lab, the Electro-mechanical Integration Lab, the Computer-Aided Design and Manufacturing Lab, the Robotic System Lab, and the Production Technology Lab.

The advisory committee of MATRC is responsible for the planning of research themes, equipments, management and funding. The dean of the Engineering College is the Chair of the committee. The Chairman of the Mechanical Engineering Department is definitely a member. The Chair of the center will be responsible for operation of the entire center.



## RECENT RESEARCH FOCUSES

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### 1. Precision machine tools and micromachining technology

- (1) The error measurement and compensation for machine tools, cutters and work pieces
- (2) The technology of on-line control work pieces precision
- (3) The advanced control technology of electrical discharge machine
- (4) The technology of ultra precision machining
- (5) The technology of micro-system machining

### 2. Computer-integrated manufacturing

- (1) Production Control and Scheduling
- (2) Material Planning and Purchase
- (3) CAD/CAE/CAM
- (4) The development of mold technique
- (5) Reverse Engineering, Rapid Prototyping, Rapid Tooling
- (6) The development of intelligent computer-integrated manufacture
- (7) Supply Chain Management
- (8) Electronic Business
- (9) Enterprise Resource Planning
- (10) Collaborative Product Electronic Commerce

### 3. The simulation and monitor of IC manufacturing process

- (1) The arrangement and simulation of IC wafer factory
- (2) The development of scheduling and formula
- (3) The development of monitor technology of fur-

nance system

- (4) The development of monitor technology of ion implanter
- (5) The development of work unit
- (6) The development of dispersed environment
- (7) The development of manufacturing process model
- (8) The development of model based SPC

## ACADEMIA-INDUSTRY COLLABORATION

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Despite of devoting to the research of new technologies, the center zealously popularizes the research findings to domestic industrial circles in order to promote academia-industry collaboration and improve the standard of domestic industry. The main objects to promote are the central factories of domestic industry and then extending to their satellite factories. By training and holding conferences, industry and academia have mutual understanding in advance and furthermore seek to long-term projects of industry-academic collaboration. Up to present, the center has established close relationship of academia-industry collaboration with domestic main mobile factories.

## FUTURE WORK

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To develop extensive researches on the influence of precision machining, manufacturing automation and intelligence, environmental protection, economy and management of factories, the center will gradually collaborate with other graduate schools at NTU, such as Department of Materials Science and Engineering, Institute of Industrial Engineering, Institute of Biomedical Engineering, Graduate Institute of Photonics and Optoelectronics, Department of Information Management and Graduate Institute of Environmental Engineering. The research will begin from cooperation between departments in college of engineering and extend to colleges in whole university for promoting researches in precision machining and manufacture intelligence.

## CONTACT INFORMATION

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Establish in : 1996

Director of Center : Professor S. H. Chang

TEL : (02)23662720

FAX : (02)23631755

Website : [http://www.eng.ntu.edu.tw/eng/chinese/dept\\_matrc.htm](http://www.eng.ntu.edu.tw/eng/chinese/dept_matrc.htm)

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# VI. COLLEGE OF BIORESOURCES & AGRICULTURE



## Academic Units

- School of Veterinary Medicine
  - Department of Veterinary Medicine
  - Graduate Institute of Veterinary Clinical Science
- Agronomy
- Bio-Environmental Systems Engineering
- Agricultural Chemistry
- Plant Pathology & Microbiology
- Entomology
- Forestry & Resource Conservation
- Animal Science & Technology
- Agricultural Economics
- Horticulture
- Bio-Industry Communication & Development
- Bio-Industrial Mechatronics
- Graduate Institute of Food Science & Technology
- Graduate Institute of Biotechnology
- Experimental Farm
- Experimental Forest
- Veterinary Teaching Hospital
- Highlands Experiment Farm
- Agricultural Exhibition Hall
- Agricultural Extension Committee
- Education & Research Center for Bio-Industrial Automation
- Hydrotech Research Institute

## The Present & Former Deans

Peng-Hwa Tsai	(1945-1946)	Chao-Chen Chen	(1977-1983)
Yi-Tao Wang	(1947-1948)	Yuan-Chi Su	(1983-1989)
Chen-Tuo Chen	(1948-1952)	Tsong-Shien Wu	(1989-1995)
Cheng Chow	(1952-1954)	Tian-Fuh Shen	(1995-1998)
Paul C. Ma	(1954-1961)	Wen-Shi Wu	(1998-2001)
Yen-Tien Chang	(1961-1965)	Ping-Shih Yang	(2001-2004)
Yuen-Liang Ku	(1965-1972)	Bean-Huang Chiang	(2004-2005)
Tang-Shui Liu	(1972-1977)	Bao-Ji Chen	(2005-present)

## HISTORY

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National Taiwan University's College of Bioresources and Agriculture was originally founded as the College of Science and Agriculture of Taihoku Imperial University. In 1943 the College of Science and Agriculture was divided into the Colleges of Science and of Agriculture. In August 2002, the College of Agriculture was renamed the College of Bioresources and Agriculture.

There were seven departments in the College when Taiwan was restored to the Chinese Government in 1945. They were Agronomy, Agricultural Engineering, Agricultural Chemistry, Agricultural Biology (the present Plant Pathology & Entomology Department), Animal Husbandry and Veterinary Medicine, Agricultural Economics, and Horticulture. Since 1945 the College has steadily expanded its programs to meet the growing demands of agricultural research. There are twelve departments now. They are Agronomy, Bio-Environmental Systems Engineering, Agricultural Chemistry, Plant Pathology and Microbiology, Entomology, Forestry and Resource Conservation, Animal Science and Technology, Horticulture, Veterinary Medicine, Bio-Industry Communication and Development and Bio-Industrial Mechatronics Engineering. Each department has a graduate institute, offering both Master and Ph.D. degrees. There are also Graduate Institute of Food Science and Technology, Graduate Institute of Biotechnology, Graduate School of Veterinary Clinic Science.

## FACILITIES

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The academic program of the college includes basic biology, the knowledge of life science theory, and the various applied skills involved in promoting production, and biological protection. The goal is to train students to understand basic life phenomena, and related knowledge and testing methods, in order to cultivate a working knowledge of applied biological technology.

In order to satisfy the national need for agricultural development, we have eight affiliated organizations: the Experimental Farm, the Experimental Forest, the Veterinary Teaching Hospital, the Highlands Experiment Farm, the Agricultural Exhibition Hall, the Agricultural Extension Committee, the Education and Research Center for Bio-Industrial Automation, and the Hydrotech Research Laboratory. In addition, four organizations are informally affiliated with our college: the Farm Machinery Workshop, the Phytotron Laboratory, the Electron Microscope Laboratory, and the Isotope Laboratory.

The buildings of the College of Bioresources and Agriculture are widely scattered around the main campus of the university. They include General Building, Agronomy Hall, Agricultural Engineering Hall, Agricultural Chemistry Halls No. 1 and 2, the Food Processing Plant, Entomology Hall, Forestry Hall, Horticulture Hall, the Horticulture Green House, the Horticultural Products Process-

ing Plant, Landscape Gardening Hall, Agricultural Machinery Hall, Food Science and Technology Hall, and Floriculture Hall.

## RESEARCH

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Our college is actively developing all agriculture-related fields. We have moved rapidly to develop agricultural production technology in order to reach international agriculture research standards. We research agricultural management, agricultural environment protection and agricultural sustainability in order to meet the national agricultural demands. We also promote agricultural standards in Taiwan. The Institutes of Entomology and Forestry have offered graduate programs for on-the-job students since 1999 and the Institute of Agricultural Economics has done so since 2000.

## GOALS

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The twenty-first century will be the century of bioresources, bioinformation, and biotechnology. At the beginning of the 21st century, the college was renamed to better focus on the richness of bioresources and bio-variety. The College will play a leading role in promoting sustainable agricultural development in Taiwan and Asia.

## CONTACT INFORMATION

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Established in: 1928

Dean: Bao-Ji Chen

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Fax: +886-2-23919626

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E-mail: [ecaa@ntu.edu.tw](mailto:ecaa@ntu.edu.tw)

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# 1. SCHOOL OF VETERINARY MEDICINE

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## CURRENT ACADEMIC PROGRAMS

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1. Department and Graduate Institute of Veterinary Medicine (baccalaureate, master and PhD program)
2. Graduate Institute of Veterinary Clinical Sciences (master program)

## BRIEF INTRODUCTION

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The profession of veterinary medicine encompasses areas of public health involved in safeguarding human health, zoonoses, food safety of animal products for human consumption, and medical diagnosis and treatments for animal diseases, animal health inspection and quarantine as well concern for animal welfare. In accordance with current worldwide trends towards veterinary education, on August 1, 2008, the Department of Veterinary Medicine in National Taiwan University has been promoted to the title of “School of Veterinary Medicine (SVM)”. Under the SVM, there are two organizations including the Department and Graduate Institute of Veterinary Medicine (baccalaureate program since 1942, master program since 1968, and the PhD program since 1977), the Graduate Institute of Veterinary Clinical Sciences (master program since 2007). The Graduate Insti-

tute of Molecular and Comparative Pathobiology and The Graduate Institute of Veterinary Public Health and Preventive Medicine will be established to meet the need of global trends.

## GOALS

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The establishment of the SVM is not only a milestone of innovation to veterinary education in Taiwan but also a critical step for the school to meet international veterinary education developments. Moreover, this is also an important step towards the regulation and prevention of zoonoses, the protection of food safety of animal products, establishment of modern veterinary medical techniques, identification of animal welfare issues, and enhancement of lab-animal research. Furthermore, it is essential to develop the veterinary specialties and continuing education.

## TEACHING RESOURCES

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In addition to the Department and Graduate Institute of Veterinary Medicine and the Graduate Institute of Veterinary Clinical Sciences, the Zoonoses Research Center, Animal Disease and Livestock Hygiene Technology Center and the Office of the NTU-Yonglin Humane Project are divisions of the SVM. All school programs are located in VM1, VM2, and VM3 Halls in addition to the NTU Veterinary Teaching Hospital.

## ACADEMIC RESEARCH

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The research achievements of the SVM are renowned not only nationally but worldwide as well. The number of published SCI journal articles averaged 43 annually during the 2005 and 2006 academic years. The total increased to 65 articles in 2007.

## FUTURE PROSPECTS

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Veterinary education at the college or school level has been a contemporary trend throughout the world. We believe that elevating the original departmental DVM level to SVM would improve the teaching quality and help attain more financial resources. Meanwhile, it would be beneficial to facilitate the integration of modern bio-medical technology and veterinary medical research; unifying the international academic community while maintaining a principal role in Asian veterinary education.

## SPECIAL FEATURES

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The education and training programs under the new SVM will foster an enhanced quality of veterinarian graduates as well as train research individuals. The SVM will continue the progression of the veterinarian specialties system in keeping with our excellent traditions.

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# 1-1. DEPARTMENT OF VETERINARY MEDICINE

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## INTRODUCTION

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The Division of Animal Science of National Taiwan University (formerly, Taipei Imperial University) was established back in 1940's when Taiwan was still a colony of Japan. The Division of Animal Science was instituted about 1942. After the return of Taiwan in 1945, Taipei Imperial University was renamed National Taiwan University, and the Division of Animal Science was changed to the Department of Animal Science and Veterinary Medicine. In 1955, the Department of Animal Science and Veterinary Medicine was divided into two divisions: Animal Husbandry and Veterinary Medicine. Four years later, both divisions became departments in their own right. Since then the Department of Veterinary Medicine has offered a five-year program leading to a degree of Bachelor of Veterinary Medicine. In 1968, the Graduate Institute started and a master degree program offered. In 1977, a Ph.D. degree program was also inaugurated. In 1990, the veterinary undergraduate classes began to be expanded according to new developments in the field. In 1995, the newly built six-story National Taiwan University Veterinary Teaching Hospital was officially opened. It is a well-equipped veterinary teaching hospital, which offers excellent clinical learning resources and

environment for senior year veterinary students and graduates.

The Department's objectives in veterinary education are to educate and train students to become professional veterinarians or competent scientists in veterinary medicine and biomedical sciences.

In accordance with the global improvement of veterinary education plan and the long-term development program of the university, the School of Veterinary Medicine has been established from the current Department on August 1st, 2008. The school will include one department (Veterinary Medicine), two centers (Development Center for Animal Disease and Livestock Hygiene Technology and Center for Zoonosis Research) and one graduate institute (Veterinary Clinical Sciences). This development is aimed to educate and train students to become highly competent veterinarians and biomedical scientists. The twenty-first century is the century of life science and biotechnology. To upgrade our knowledge and techniques in veterinary and biomedical sciences to a world class level and meet challenges successfully in this century is the goal of all members of this Department and Graduate Institute!

## FACULTY

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Full-time Faculty: 22

Adjunct Faculty: 11

Project-Appointed Faculty: 1

Professors: 13

Associate Professors: 6

Assistant Professors: 2

Instructors: 1

Project-Appointed Assistant Professor: 1

Academic Qualifications of Full-time Faculty

PhD degree: 21

Master degree: 1

Academic Qualifications of Project-Appointed Faculty

PhD degree: 1

### Chair/ Professor

Chen-Hsuan Liu      Ph.D., University of California-Davis, USA.

### Professor

Fun-In Wang      Ph.D., University of Illinois at Urbana-Champaign, USA.

Ching-Ho Wang      Ph.D., Louvain University, Belgium.

Chang-Yung Fei      Ph.D., NTU, ROC.

Victor Fei Pang      Ph.D., University of Illinois at Urbana-Champaign, USA.

Rea-Min Chu      Ph.D., Iowa State University, USA.

Dah- Sheng Lin      Ph.D., Cornell University, USA.

Tzong-Fu Kuo      Ph.D., NTU, ROC.

Peng-Heng Chang      Ph.D., Auburn University, USA.

Ling-Ling Chueh      Ph.D., Kyushu University, Japan.

Chin-Cheng Chou      Ph.D., University of California, L.A., USA .

Hsiang-Jung Tsai      Ph.D., Ohio State University, USA.

Jeou-Jong Shyu      Ph.D., University of Illinois at Urbana-Champaign, USA.

### Associate Professor

Shao-Kuang Chang      Ph.D., North Carolina State University, USA.

Chian-Ren Jeng      Ph.D., North Carolina State University, USA.

Mei-Mei Chen      Ph.D., NTU, ROC.

Jiann-Gwu Lee      Ph.D., North Carolina State University, USA.

Tong-Rong Jan      Ph.D., Michigan State University, USA.

Fang-Chia Chang      Ph.D., University of Texas Medical Branch at Galveston, USA.



**Assistant Professor**

Cho-Hua Wan Ph.D., University of Missouri at Columbia, USA.

S.H. Vincent Hsiao Ph.D., University of Illinois at Urbana-Champaign, USA,

**Instructor**

Chiung-Hsiang Cheng M.S., NTU, ROC.

**Project-Appointed Assistant Professor**

Albert Taiching Liao Ph.D., NTU, ROC.

**BUILDINGS AND FACILITIES****BUILDINGS**

The Department of Veterinary Medicine is housed in three buildings, designated VM I, II and III. VM I and III are primarily for teaching and research, and VM II is primarily for laboratory animal housing, but also has laboratories and classrooms. Clinical education is supported by a 6-story Veterinary Teaching Hospital. Teaching and research are the major activities for students, veterinarians, and research scientists. There are many well-equipped laboratories, including labs of vet. physiology, vet. anatomy, vet. pathology, vet. pharmacology, vet. bacteriology, vet. virology, vet. parasitology, vet. clinical pathology, vet. immunology, vet. public health, electron microscopy, diseases of wild animals, diseases of swine, diseases of poultry, diseases of fish, diseases of horse, diseases of large animals, small animal internal medicine and surgery, etc.

**SPECIAL FACILITIES**

Transmission and scanning electron microscopes, Flow cytometer, Ultramicrotome, DNA thermal cycler, Real time quantitative PCR, ELISA reader, Capillary electrophoresis, 15-parameters semi-automated hematology analyzer, Fraction collector, Electrocardiograph, Operation microscope, Automatic clinical chemistry analyzer, Blood gas analyzer, ST4 Compact 4 channel coagulation instrument, Cryostat, Noninvasive blood pressure monitor, Inverted microscope. HPLC, Speed refrigerated centrifuge, QBC-V Hematology, Animal clinical physiological monitor, Cytospin centrifuge, Isoelectric focusing facilities, Echocardiograph, Ultrafiltration concentrator, Transcutaneous PO<sub>2</sub> and PCO<sub>2</sub> monitor, Vet fibroscope, Ultracentrifuge, Heart and Lung supportive system, Endoscopic teaching system, X-ray machine, Gastrointestinal endoscope, Ion coater, Critical point dryer, Vacuum evaporator, Ultrasonic endoscope, and Aperio digital pathology system.

**CURRICULUM****UNDERGRADUATE PROGRAMS**

The department offers a five-year program leading to a Bachelor's degree of veterinary medicine (BVM). Students must complete and pass all required courses during the first four years before they are allowed to proceed to the final year's course. A minimum of 182 credit units is required for the degree of BVM.

### Core Courses for the Undergraduates:

General Chemistry and Lab (4), Organic Chemistry and Lab (4), Biochemistry and Lab (6), Embryology (2), Veterinary Anatomy and Lab (8), Veterinary Physiology and Lab (8), Animal Histology and Lab (4), Veterinary Bacteriology and Lab (3), Veterinary Parasitology and Lab (3), Veterinary Virology and Lab (3), Veterinary Pathology and Lab (8), Veterinary Immunology and Lab (3), Biostatistics (2), Veterinary Diagnostic Imaging and Clinical Diagnosis (3), Veterinary Pharmacology and Lab (7), Veterinary Clinical Pathology and Lab (4), Veterinary Theriogenology (4), Veterinary Public Health and Lab (3), Animal Feeding and Management (3), Veterinary Genetics (2), Veterinary Anesthesiology and Lab (2), Small Animal Surgery Skills and Lab (2), Large Animal Surgery Skills and Lab (2), Small Animal Surgery (3), Ruminant Medicine (2), Diseases of Swine (4), Poultry Diseases (4), Equine Diseases (2), Animal Hospital Practices (1), Aquatic Animal Diseases (3), Small Animal Internal Medicine (4), Veterinary Epidemiology (2), Veterinary Jurisprudence and Ethics (1), Clinical Conference (2), Clinical rotation (10), Necropsy (2)

### GRADUATE PROGRAMS

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The graduate institute consists of four divisions, namely, veterinary pathobiology, veterinary public health, basic veterinary science and animal welfare. A new graduate institute of Veterinary Clinical Sciences was established in year 2007. The graduate school currently offers a two to four year Master's degree program and a two to seven year Ph.D. degree program. A minimum of twenty-four credit units (six units of thesis not included) is required for the Master's degree. All Ph.D. students must fulfill both course and research requirements for their Ph.D. degree. A minimum of eighteen credit units (twelve units of thesis not included) is required for the Ph.D. degree. In addition, three Ph.D. research-related publications, including at least two published or accepted by SCI-listed journals, are graduation requirements for all Ph.D. candidates.

### ACADEMIC ACTIVITIES

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Weekly clinical case conferences are held as oral presentations by final year veterinary interns. In the graduate institute, graduate seminars are held weekly. In addition, scientific seminars are held regularly and local or international speakers are invited to give the talks.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) Clinical veterinary medicine
- (2) Research on basic/preclinical veterinary sciences
- (3) Biotechnology
- (4) Comparative medicine
- (5) Laboratory animal medicine
- (6) Public health

### ■ Further studies

Our graduates are eligible to apply for most post-graduate schools of veterinary medicine and biomedical science in Taiwan and abroad.

### ■ Career options

Clinicians in general practice; Clinicians in public sectors, Biotechnology related industries; Universities/research institutes; Administrative positions as public servants of government (e.g. council of agriculture, local animal disease control center; disease quarantine, animal welfare and conservation); Meat inspection; Consultants for animal pharmaceutical or pet food companies.

## CONTACT INFORMATION

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Established in: 1942

Chair: Chen-Hsuan Liu

Tel: +886-2-33663855

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E-mail: [chhsuliu@ntu.edu.tw](mailto:chhsuliu@ntu.edu.tw)



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# 1-2. INSTITUTE OF VETERINARY CLINICAL SCIENCE

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## INTRODUCTION

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The Department of Veterinary Medicine at the National Taiwan University has been established for 65 years since 1924. With time, clinical veterinary medicine has been playing much more important roles for veterinary education in the university. The veterinary graduate school started to set up clinical divisions for advanced clinical training of veterinary graduate students twenty years ago. Graduate studies combined with residency training started in the divisions of small animal surgery and internal medicine ten years ago. In this combined program, the graduate students of surgery and internal medicine will be awarded a master degree and a certificate of residency training following completion of three to four years of clinical training as well as master's study. The Graduate School of Clinical Veterinary Science was newly established in the College of Bio-Resources and Agriculture on 1 August 2007.

The Institute of Clinical Veterinary Science consists of divisions of companion animal medicine, farm animal medicine, and wild animal medicine. Annually, twelve graduate students in different disciplines are admitted to the graduate school to receive clinical training. Besides, there is a 3-year

full-time small animal residency program offered by the National Taiwan University Veterinary Hospital. There are currently 10 clinical faculty members in the graduate school. Faculty from the NTU medical and dental schools are also involved in clinical teaching and training in the school.

The aims of future development of the institute are to provide advanced clinical training for clinical graduate students/residents being more competitive in the veterinary profession. Besides, we also select promising senior veterinarians to train as clinical faculty. Because a well organized veterinary residency program has been developed only at the National Taiwan University to date, we will help other veterinary schools/departments to develop veterinary residency training system in the future. In addition, the schools will also contribute to continuous education for practicing veterinarians and establishment of the Associations of veterinary specialties in Taiwan.

## FACULTY

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Full-time Faculty: 10

Adjunct Faculty: 1

Professors: 4

Associate Professors: 2

Assistant Professors: 2

Instructors: 2

Academic Qualifications of Full-time Faculty

PhD degree: 8

Master degree: 2

### Director / Professor

In-Lin Wu                      Ph.D., NTU, ROC.

#### Professor

Hui-Pei Huang                Ph.D., Glasgow University,  
UK.

Lih-Sen Yeh                    Ph.D., NTU, ROC.

Chung-Tien Lin                Ph.D., University of Cam-  
bridge, UK.

#### Associate Professor

Chau-Hwa Chi                 Ph.D., NTU, ROC.

Ivan-Chen Cheng             Ph.D., University of Florida,  
USA.

#### Assistant Professor

Bi-Ling Su                      Ph.D., University of  
Munich, Germany.

Chung-Hsi Chou                Ph. D., Mississippi State  
University, U.S.A.

#### Instructor

Ji-Jong Lee                      M.S., Louisiana State  
University, USA.

Ya-Pei Chang                    M.S., University of  
Glasgow, UK.

## FACILITIES

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EKG, respiratory monitor, noninvasive blood pressure monitor (Oscillatory & Doppler), veterinary anesthesia apparatus, animal physiological monitor, Doppler cardio ultrasound, endoscopy, electroencephalogram, hemodialysis machine, X-ray, C-arm, MRI, operating microscope, electrol high speed bone drill, ultrasound phacoemulsification machine, diode laser, laser blade, lactate analyzer, blood gas analyzer, urinalysis analyzer, joint motion function analyzer, full automatic biochemistry analyzer, blood coagulation analyzer, electrolyte analyzer, acid/base ion analyzer.





## CURRICULUM

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The graduate institute consists of two divisions, namely, economic and zoo animal group and companion animal group. The graduate school currently offers a two to four year Master's degree program. A minimum of twenty-four credit units (six units of thesis not included) is required for the Master's degree.

### Courses for the Graduates:

Thesis (6), Independent Study (I)(1), Independent Study (II)(1), Independent Study (III)(1), Independent Study (IV)(1), Seminar (I)(1), Seminar (II)(1), Seminar (III)(1), Seminar (IV)(1), Companion Animal Medical and Surgery Practice (I)(4), Companion Animal Medical and Surgery Practice (II)(4), Companion Animal Medical and Surgery Practice (III)(4), Companion Animal Medical and Surgery Practice (IV)(4), Seminar On Small Animal Emergency and Critical (I)(1), Seminar On Small Animal Emergency and Critical (II)(1), Seminar On Small Animal Emergency and Critical (III)(1), Seminar In Small Animal Orthopedics (2), Small Animal Ophthalmology (2), Special Topics In Small Animal Clinical Pathology (2), Large and Wild Animals Practice (I)(4), Large and Wild Animals Practice (II)(4), Large and Wild Animals Practice (III)(4), Large and Wild Animals Practice (IV)(4), Principles Of Horse Behavior (1)

## ACADEMIC ACTIVITIES

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- a. Clinical case meeting every evening
- b. Mortality and morbidity seminar every week
- c. Summer training program for new residents
- d. Construction of manuals, videos and reference books for clinical teaching and training.
- e. Continuous education (CE) programs for practicing veterinarians.
- f. Research projects supported by the National Science Council, Council of Agriculture.
- g. Establishment of Taiwan Companion Animal Medical Association to promote small animal specialty training, CE, and certification.
- h. Attending national and international conferences and publishing papers

## CAREERS AND FURTHER STUDIES

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- a. To offer high quality of veterinary medical services to the society:
  - I. Small animal internal medicine
    - i. General internal medicine
    - ii. Cardiovascular
    - iii. Endocrinology
    - iv. Dermatology
    - v. Kidney and urinary system
    - vi. Oncology
  - II. Small animal surgery
    - i. Soft tissue surgery
    - ii. Orthopedics
    - iii. Ophthalmology
    - iv. Dentistry
  - III. Diagnostic Imaging
  - IV. Large animals and wild animals
  - V. Clinical pathology
- b. Private practice
- c. Clinical teachers
- d. Biotechnology industries
- e. Further education and training in the Europe or America

## CONTACT INFORMATION

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Establishment year: 2007

Director: In-Lin Wu

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## 2. DEPARTMENT OF AGRONOMY

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### INTRODUCTION

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The antecedent of this department was the Crop Science Lectureship and the Plant Breeding Lectureship of Taihoku (Taipei) Imperial University founded by Japan in 1928. Following Taiwan's retrocession to Chinese Sovereignty in 1945, these two Lectureships were reorganized and renamed the Department of Agronomy. This was one of the oldest departments in the College of Agriculture at that time. The Biometry Lab and the Seed Technology Lab were established in 1946 and 1957, respectively. From that time on, this Department gradually expanded, and M.S. and Ph.D. programs were formally started in 1956 and 1967, respectively.

Aiming to promote basic and applied research in crop science, the Department has recently made efforts to recruit faculty with strong backgrounds in modern agriculture and bioscience, as well. Improving research facilities is also a major concern. As to teaching and research, the faculty keep track of the developments in high technology. In the applied field, they work hard to contact, guide and solve the problems of today's agriculture.

The Goal of this department is to offer students a broad basic knowledge on which a solid career in Crop Science can be built. The undergraduate program prepares the students for a career in various fields of Crop Science as well as for further study. The graduate program, leading to the degrees of master of science (M.S.) and doctor of philosophy (Ph.D.), aims to prepare the students for a career in teaching and/or research.

Each year the Department of Agronomy has research projects in cooperation with National Science Council, Commission of Agriculture and various agencies of the governments.

The future research will emphasize the fields of molecular breeding, biotechnology, molecular genetics, crop production and management, crop physiology, turfgrass management and weed control, germplasm preservation, statistics and bioinformatics.

## FACULTY

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Full-time: 21

Part-time: 6

Ph.D. Degree: 25

M.S. Degree: 2

### Chair/ Professor

Yun-Ming Pong      Ph.D., University of  
Kentucky

### Full-Time

#### Professor

Jaw-Shu Hsieh      Ph.D., NTU

Ching-Huei Kao      M.S., NTU

Ching Liu              Ph.D., University of Idaho

In-Shong Hsia      M.S., NTU

Huu-Sheng Lur      Ph.D., Cornell University

Warren H.J. Kuo      Ph.D., NTU

Jen-Pei Liu            Ph.D., University of Ken-  
tucky

Chen-Tuo Liao      Ph.D., Colorado State Uni-  
versity

#### Associate Professor

Kae-Kang Hwu      Ph.D., Washington state  
University

Hsiu-Yung Su      Ph.D., Calgary University

Yuh-Chyang Charng Ph.D., Ludwig-Maximilians  
University, Munich, Ger-  
many

Shu-Jen Wang      Ph.D., NTU

#### Assistant Professor

Yue-Wen Wang      Ph.D., Texas A&M Univer-  
sity

Shun-Fu Lin            Ph.D., Iowa State University

Men-Chi Chang      Ph.D., Cornell University

Li-Yu Liu              Ph.D., Texas A&M Univer-  
sity

Song-Bin Chang      Ph.D., Wageningen Univer-  
sity

Kai-Yi Chen            Ph.D., Cornell University

Yann-Rong Lin      Ph.D., Texas A&M  
University

#### Instructor

Wen-Dar Huang      Ph.D., NTU

#### Part-Time

Su-May Yu              Ph.D., University of  
Arkansas

Kuo-Renn Chen      Ph.D., NTU

Chi-Ming Yang      Ph.D., University of  
Nebraska

Chen-Hung Kao      Ph.D., North Carolina State  
University

Chin-Fu Hsiaq      Ph.D., University of  
Wisconsin

Ming-Shu Chiang      Ph.D., NTU

## FACILITIES

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Nucleic acid-protein analyzing equipment, Scanning electron microscope, Gene-particle Gun, gas chromatography, High performance liquid chromatography, NIR, LI-6200 portable photosynthesis system, Fluorescent spectrophotometer, Densimeter, LS6000TA, Liquid scintillation counter, PCR machine, ELISA reader, AFLP, Differential display analyzer, Electrophoresis equipment, Atomic absorption spectrophotometer, UV-VIS spectrophotometer, Refrigerated ultracentrifuge, Stereo microscope, Invert phase-contrast microscope, Phase-contrast-dark field microscope, Fluorescent microscope, Ultracut-E, etc.

## COURSES

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### Undergraduate Programs

The department offers a four-year program for undergraduate students leading to the Bachelor's degree of Agronomy. Students must complete a minimum of 128 credit hours of course work.

Organic Chemistry & Lab.(4), Calculus(6) (either one of the above 2), Plant Physiology & Lab.(4), Introduction to Applied Mathematics(4), (either one of the above 2) General Chemistry & Lab.(4), Introduction to Crop Science(2), General Botany & Lab.(4), Soil Science & Lab.(3), Genetics & Lab.(4), Statistics(3), Experimental Design(3), Crop Breeding(3), Introduction to Crop

Production(3), Plant Disease Control & Lab.(4), Crops (I)(II)(6), Crop Lab. (I) (II)(2), Thesis (I)(II)(2), #@Regression Analysis(I)(3), Plant Cell and Tissue Culture & Lab.(4), \*Introduction of Seed Science & Technology(3), \*Weed Control & Lab.(3), \*Plant Germplasm Resources(2), \*Introduction to Agricultural Economics(2), \*Agricultural Marketing(3), %Crop Physiology(3), %Biology Chemistry(4), %Crop Growth & Development(3), %Cell Biology(4), %Molecular Biology(4), %Molecular Genetics(4), %Crop Genetics Engineering(3), %Management of Biotechnologically Modified Plants(2), %Cell biology(3), #Methodology of Plant Breeding(3), #Quantitative Genetics(3), #@Techniques of Factorial Experimentation(3), @Method of Advanced Biometrics(I)(3), @Method of Advanced Biometrics(II)(3), @Statistical Computations and Analysis(3), @Introduction to Statistical Genetics(3), @Statistical Methods in Biological Assay(3), @Statistical Analysis for Genomics Data(3), @Introduction to Bioinformatics(3). A minimum of 12 credit hours is required from the courses marked "\*" or "%" or "#" or "@"

### Master's Programs

The Graduate Institute comprises two divisions of Crop Science and Biometry. Each offers a 1 to 4 year program toward the Masters degree of Agronomy. Candidates for a Master's degree must complete a minimum of 24 credit hours and Master's thesis.

The required courses and credits are listed as follows:

### Crop Science division

\*@Seminar (2), \*Advanced Crop Science(3), \*Advanced Crop Physiology(3), \*Crop Physiology Lab.(2), \*Research Method in Crop Science(2), @Advanced Crop Breeding(3), @Research method in Crop Breeding(2)

"\*" indicates courses for crop science team

"@" indicates courses for genetic breeding team

### Biometry division

Seminar(2)

### Doctoral Programs

The Graduate Institute comprises two divisions of Crop Science and Biometry. Each division offers a 2 to 7 year program toward the Doctor's degree of Agronomy. Candidates for Doctor's degree must have completed a minimum of 18 credit hours and dissertation.

The required course and credits is: Seminar(2)

## ACADEMIC ACTIVITIES

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1. Seminars: The department of Agronomy holds the seminars once a week, each of which lasts two hours. The faculty and graduate students are invited to present papers on issues in Crop Science and recent laboratory experiment reports.
2. Co-sponsor the annual meetings of Chinese Society of Agronomy and the Weed Science Society of the Republic of China.
3. To edit a quarterly publication, Corp, Environment & Bioinformatics.
4. To edit a semiannually publication, Weed Science Bulletin.
5. Invite domestic and overseas scholars to give occasional talks and seminars.
6. Occasional short-term training programs to introduce the latest theory and technique application.
7. Each year the Department of Agronomy has research projects in cooperation with National Science Council, Commission of Agriculture and various agencies of the Governments.

## CAREERS AND FURTHER STUDIES

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### 1. Professional abilities

- (1) Production management: cultivation technology, weed control, seed and seeding production.
- (2) Biological technology: crop response to environmental stress, gene translation, cell raise, crop anatomy, immunity, histochemistry localization, management of biotechnologically modified plant, crop functional genomics.
- (3) Molecular Breeding: crops heredity characteristic, gene analysis, breeding method.
- (4) Biological Statistics and Bioinformatics: The statistical method applies to the crops correlation experimental designs and data analysis, explanation and deduction; Application of Bioinformatics.

### 2. Further studies

Graduates can do further study in any of the following fields: biology information, statistics, molecular biology, agronomy, and life science.

### 3. Career options

Graduates may get jobs in educational institutions, biology and biotech industries, information business, research institutions, agricultural laboratories, overseas units, agricultural technique group, and so on.

## CONTACT INFORMATION

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Established in: 1945

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E-mail: [pong@ntu.edu.tw](mailto:pong@ntu.edu.tw)



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# 3. DEPARTMENT OF BIOENVIRONMENTAL SYSTEMS ENGINEERING

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## INTRODUCTION

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The Department of Bioenvironmental Systems Engineering (DBSE) originated from the Agricultural Engineering Chairs of Taihoku Imperial University, and thus is one of the oldest departments of the university. It was named the Agricultural Engineering Department during the period from 1945 to 2001. In response to the needs of the changing society, the department was renamed the Department of Bioenvironmental Systems Engineering in 2001. Currently, the department has 21 faculty members (13 full professors, 5 associate professors and 3 assistant professors) and offers engineering degrees for bachelor, master and Ph.D. programs. There are approximately 170 undergraduate and 140 graduate students enrolled in DBSE. The department also houses the following laboratories: Surveying Lab., Environmental Chemistry Lab., Soil mechanics and Erosion Lab., Fluid mechanics Lab., Environmental Biology Lab., Irrigation and Drainage Lab., and computer lab. The department focuses teaching and research on three interrelated categories: soil and water resources engineering, bioenvironmental engineering, and environmental informatics and systems engineering. Curriculum subjects cover a very broad spectrum. In particular, the department initiated an inter-college ecological engineering curriculum pro-

gram, aimed at integrating engineering and ecological practices. The faculty researches actively and productively. Research funding comes from the National Science Council, the Council of Agriculture, Water Resources Agency, Environmental Protection Administration, irrigation associations and many consulting companies. The department also maintains long-term and close collaborations with the Hydrotech Research Institute of NTU and the Agricultural Engineering Research Center.

## FACULTY

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Full-time: 21

Part-time: 4

Ph.D. Degree: 21

M.S. Degree: 0

Bachelor's Degree: 0

### Chair/ Professor

Hung-Pin Huang      Ph.D., Univ. of Iowa

### Full-Time

#### Professor

Tsun-Kuo Chang      Ph.D., Purdue Univ.

Ming-Hsi Hsu      Ph.D., NTU

Jen-Chen Fan      Ph.D., Purdue Univ.

Fi-John Chang      Ph.D., Purdue Univ.

Siian-Tang Han      Ph.D., Universitat Karlsruhe



Chen-Wuing Liu	Ph.D., UC Berkeley
Yih-Chi Tan	Ph.D., Cornell Univ.
Wen-Lian Chang	Ph.D., UC Davis
Ming-Daw Su	Ph.D., Utah State Univ.
Chung-Min Liao	Ph.D., Iowa State Univ.
Ke-Sheng Cheng	Ph. D., Univ. of Florida
Fu-Chun Wu	Ph.D., UC Berkeley
Ching-Pin Tung	Ph.D., Cornell Univ.
Tsang-Jung Chang	Ph.D., Univ. of Illinois at U.C.
Yu-Pin Lin	Ph.D., Univ. of Illinois at U.C.

**Associate Professor**

Wen-Shan Hou	Ph.D., Univ. of Tokyo
Hsiu-Chuan Liao	Ph.D., Duke Univ.

**Assistant Professor**

Cheng-I Hsieh	Ph.D., Duke Univ.
Hwa-Ling Yu	Ph.D., Univ. of North Carolina at Chapel Hill
Sau-Wai Yam	Ph.D., Univ. of HongKong

**Part-Time****Professor**

Ming-Tang Wu	M.S., NTU
Yuan-Chiuan Lee	Ph.D. Chinese Culture Univ.

**Associate Professor**

Kuang-Cheng Huang	Candidate of Dr., T.U. Braunschweig
Jihn-Sung Lai	Ph.D., UC Berkeley

**FACILITIES**

The department occupies teaching and research space in several neighboring buildings. Building No. 5 houses the department office, faculty offices, classrooms, conference and colloquium rooms, Surveying Lab. and a computer lab. A two-story experimental building houses Environmental chemistry Lab., Soil mechanics and Erosion Lab., Irrigation and Drainage Lab., and Environmental Biology Lab. All laboratories are equipped with state-of-the-art facilities. The Hydrotech Research Institute also has much advanced equipment to support fluid mechanics experiments. The department also occupies approximately four-stories of space in two other buildings for faculty offices, laboratories, and study rooms for graduate students.

**COURSES****Undergraduate Programs**

The normal period of undergraduate study is four years and the minimum credit hours required for graduation is 134. Graduates are accredited the Bachelor of Engineering degree.

Calculus (I)(II)(8), General physics (including laboratory)(8), General Biology (including laboratory)(4), General Chemistry(c) (including laboratory)(4), Engineering Mathematics (I)(II)(6), Bioenvironmental Systems Engineering(2), Engineering Mechanics(4), Fluid Mechanics (including laboratory)(4), Environmental Chemistry (including laboratory)(4), Hydrology(3), Statistics(3), Water Resources Engineering(3), Soil Mechanics (including laboratory)(4), Computer Application and Programming(2), General Ecology(3), Environmental Engineering (3), Environmental Systems Analysis(3), Ecological Engineering(3), Spatial information(3)

### Master Programs

The duration of the master program is from two to four years with a minimum requirement of 30 credit hours (including six hours for the thesis) for graduation. After completing the requirements, the graduates are accredited the Master of Engineering degree.

### Ph.D. Programs

The doctoral program requires a minimum of 36 credit hours including 12 hours for Ph.D. dissertation. Doctoral students must complete all degree requirements within seven years.

## ACADEMIC ACTIVITIES

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Various lectures and symposia are held each year at the department. Domestic and foreign scholars and specialists are invited on an occasional basis.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

#### Environmental Engineering

- (1) Bioenvironmental engineer
- (2) Architectural design and environmental planning
- (3) Bioenvironmental toxicology
- (4) Bioenvironmental mechanics
- (5) Environmental microclimate

#### Land and Water Resources Engineering

- (1) Ecological engineering
- (2) Soil and water conservation
- (3) Groundwater
- (4) Irrigation and drainage
- (5) Watershed management Environmental

#### Informatics and Systems Engineering

- (1) Geographic information systems
- (2) Remote sensing
- (3) System analysis and sustainable development
- (4) Artificial neural networks and expert systems
- (5) Water resources planning and management

### ■ Further studies

- (1) Bioenvironmental systems engineering, biological engineering, medical engineering
- (2) Environmental engineering, water resources engineering, civil engineering
- (3) Information engineering, information management

### ■ Career options

- (1) Civil servants in Environmental Protection Administration, Water Resources Agency, Soil and Water Conservation Bureau, Council of Agriculture, Irrigation Association, etc.
- (2) Academic and research institutes including universities/colleges and Agricultural Engineering Research Center
- (3) Consulting industries related to environmental engineering, water resources engineering, civil engineering, etc.

### CONTACT INFORMATION

---

Established in: 1945

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# 4. DEPARTMENT OF AGRICULTURAL CHEMISTRY

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## INTRODUCTION

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This department was one of the earliest instituted disciplines when the University was founded by the Japanese government as the seventh Imperial university back in 1928. The department established one of the earliest graduate institutes of the University and started implementing a Master's program in 1947. The undergraduate program was divided into two divisions, namely, Agricultural Product Processing, and Soils and Fertilizer in 1961. Ph.D. programs were started in 1968.

The Department of Agricultural Chemistry of the College of Bioresources and Agriculture is a unit of the graduate school and offers a flexible program of study for the M.S. and Ph.D. in various disciplines: soil chemistry, soil survey and classification, molecular microbiology, environmental microbiology, industrial microbiology, plant nutrition, transgenic technology, pesticide chemistry, food chemistry, plant biochemistry, and others. The curriculum usually begins with emphasis on laboratory research experience. The doctoral program begins with one year of courses fitted to each student's particular needs. In the second and subsequent years, essentially full time research is required. The doctoral program particularly

emphasizes competent independent research. Graduate students need to enroll in one seminar course per semester in their first and second years. Creativity is provided by the participation with the faculty in discussion groups. At least one paper published in international scientific journal is required for graduates seeking the degree of Ph.D.

## FACULTY

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Full-time: 16

Part-time: 5

Ph.D. Degree: 16

### Chair/ Professor

Dar-Yuan Lee      Ph.D., Univ. of California

### Full-time

#### Professor

Zueng-Sang Chen      Ph.D., NTU

Ming-Kuang Wang      Ph.D., Rutgers Univ.

Ren-Shih Chung      Ph.D., NTU

Chao-Ming Lai      Ph.D., NTU

Chia-Yin Lee      Ph.D., Univ. of Kentucky

Jui-Hung Yen      Ph.D., NTU

Hsi-Mei Lai      Ph.D., Univ. of Illinois

Lean-Teik Ng      Ph.D., Univ. of Paris 6

#### Associate Professor

Whi-Fin Wu      Ph.D., Univ. of Iowa

Nan-Wei Su      Ph.D., NTU

#### Assistant Professor

Chien-Teh Chen      Ph.D., Cornell Univ.

Chwan-Yang Hong      Ph.D., NTU

Nai-Chun Lin      Ph.D., Cornell Univ.

Chun-Hua Hsu      Ph.D., NTU

Pei-Jen Chen      Ph.D., Duke Univ.

## FACILITIES

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The major buildings include: Two Buildings for Agricultural Chemistry, soil environmental chemistry laboratory, and soil survey and classification laboratory.

Major teaching and research facilities include various models of UV-VIS spectrophotometers, preparative ultracentrifuges, fraction collectors, fermentors, freeze driers, gas chromatographs, high-pressure liquid chromatographs, CNS analyzers, X-ray diffractometer, flame photometers and atomic absorption spectrophotometer, conductivity meters, supercritical fluid extractor, dynamic light scattering spectrophotometer, plant growth chambers, amino acid analyzer, Laminar flows, automatic image analyzer, capillary electrophoretic apparatus, ELISA photometric system, HPLC Quadrupole-time of flight tandem mass spectrometer and inductively coupled plasma atomic emission spectrophotometer, etc.

## COURSES

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### Undergraduate Programs

After students complete a minimum of 135 credits of course work, the degree of B.S. in Agricultural is conferred.

Calculus(6), General Physics and Lab.(8), General Chemistry and Lab.(8), General Biology and Lab.(6), Analytical Chemistry and Lab.(6), Organic Chemistry and Lab.(8), Physical Chemistry(6), General Microbiology and Lab.(4), Biochemistry and Lab.(5), Seminar(2), Fundamental Topic on Agricultural Chemistry(1), Soil Science and Lab.(3), Plant Nutrition and Lab(3), Soil Chemistry and Lab(3), Environmental Chemistry(2), Food chemistry I (2), Environment Microbiology and Lab(3), Molecular Biology(2), Chemical Analysis of Biomaterials(2), Lab of Chemical Analysis of Biomaterials(2), Agricultural Pesticides(2)

### Graduate Programs

In the Master program, students must complete a minimum of 24 credits of course work and a thesis (which is approved before a 3 to 5 member thesis committee in a 2 to 4 year period) to be awarded the degree of M.S. in Agriculture.

In the Doctoral program, students must complete a minimum of 18 credits of course work and a thesis (which is approved before a 5 to 9 member thesis committee in a 2 to 7 year period), to receive the degree of Ph. D. in Agriculture.

## ACADEMIC ACTIVITIES

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This year, the Department of Agricultural Chemistry received a total of 33 research grants, totaling NT\$36,936,000 from the National Science Council, the Council of Agriculture, Department of Health and various institutes. Prominent scholars and professionals are frequently invited to give special lectures for the staff and graduate students.

### Careers and further studies

Today's graduates in the Department of Agricultural Chemistry are qualified for a variety of challenging and rewarding careers. With graduate training, a host of opportunities with universities, government agencies and private enterprise are open to be professors, scientists and managers. These include work with biotechnology companies, pesticide and fertilizer research, pharmacy industry, environment monitoring specialist, bioresource management and university-level teaching and research. Many of our undergraduates enter our graduate school to refine their skills, some even go on to seek higher degrees overseas. Each year students pursue MS or Ph.D. degrees in other fields, such as chemistry, biology, microbiology, biotechnology, bioinformatics, biochemistry, chemical engineering, environmental engineering, environmental science, environment protection, biomedicine and food science.

## CONTACT INFORMATION

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Established in: 1945

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# 5. DEPARTMENT OF PLANT PATHOLOGY AND MICROBIOLOGY

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## INTRODUCTION

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The Department of Plant Pathology and Microbiology at National Taiwan University was founded to confront the need for experts in plant pathology and microbiology. Studies on plant pathology have long been the focus of research conducted in the Department. The issue of plant quarantine has become increasingly important, especially since Taiwan acceded to the World Trade Organization in 2002. Students and research personnel in the department are well qualified for this responsibility. To expand the research fields of the Department and also reveal the solid training of scientific personnel in microbiology, microbiology field has been included in the Department.

Although the Department of Plant Pathology and Microbiology was founded on August 1, 2003, the study of Plant Pathology at NTU has a long and distinguished history. The Department of Plant Pathology and Entomology was established in 1949, making it one of the first education and research units at the University. It was originally divided into the Division of Plant Pathology and the Division of Entomology, but these two divisions became independent departments in 1998. The Department of Plant Pathology further became

the Department of Plant Pathology and Microbiology to provide more thorough training in basic and applied microbiological science and broaden the careers for students.

The goals of teaching are to nurture students with a solid background in plant pathology and microbiology, to establish research personnel for the country, and to train experts specialized in plant pathology and microbiology. To graduate from the Department of Plant Pathology and Microbiology, students must take courses in the fields of plant pathology, microbiology, cell biology and molecular biology and also be trained in various techniques in biotechnology. Courses provided by the Department include basic and applied subjects in plant pathology (plant pathology, methods in plant pathology, plant etiology, plant disease and diagnosis, plant disease control, etc.), microbiology (microbiology, mycology, bacteriology, virology, nematology, applied microbiology, etc.), and biotechnology (molecular biology, molecular virology, genetics, etc.). Following this academic tradition, students who graduate from the Department of Plant Pathology and Microbiology will surely contribute their learning and expertise to society.

The main research foci of the Department of Plant Pathology and Microbiology are: to study the biological nature of various plant pathogenic and useful microorganisms, including fungi, bacteria, nematodes, viruses and phytoplasms; to understand the importance of non-infectious plant diseases; to become familiar with techniques for diagnosing plant diseases and methods for plant disease control; to dissect interactions between pathogens and their plant hosts; to explore the bioresources of microorganisms and their metabolites for practical application.

Looking into the future, the department has three development goals. Firstly, it aims to increase the facilities and resources for research. Secondly, it strengthens the basic research and applied technology in plant pathology and microbiology and develop a strong and close relationship with biotechnology industry. Finally, it works to establish a public system of plant protection personnel and plant doctors for the country.

## FACULTY

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Full-time: 12

Part-time: 8

Ph.D. Degree: 20

### Head/ Professor

Chao-Ying Chen Ph.D., Univ. of California, Davis, U.S.A.

### Full-time

#### Professor

Shean-Shong Tzean Ph.D., McGill Univ., Canada.

Chan-Pin Lin Ph.D., Rutgers Univ., U.S.A.

En-Jang Sun Ph.D., NTU

Ruey-Fen Liou Ph.D., Indiana Univ., U.S.A.

Ya-Chun Chang Ph.D., Univ. of California, Berkeley, U.S.A.

#### Associate Professor

Bie-Yun Tsai Ph.D., Univ. of California, Riverside, U.S.A.

Wei-Chiang Shen Ph.D., Texas A&M Univ., U.S.A.

Ting-Hsuan Hung Ph.D., NTU

Hsin-Hung Yeh Ph.D., Univ. of California, Davis, U.S.A.

#### Assistant Professor

Tang-Long Shen Ph.D. Cornell Univ., U.S.A.

## Part-time

### Professor

Hong-Ji Su	Ph.D., Michigan State Univ., U.S.A.
Mei-En Liu	Ph.D., NTU
Wen-Shi Wu	Ph.D., Cornell Univ., U.S.A.
Tsung-Che Tseng	Ph.D., Massachusetts Univ., U.S.A.
Yu-Chan Chao	Ph.D., Univ. Arkansas, U.S.A.
Tun-Tschu Chang	Ph.D., Hawaii University, U.S.A.

### Associate Professor

Yuan-Hsun Hsu	Ph.D., Osaka Prefecture Univ., Japan
Ying Yeh	Ph.D., Texas A&M Univ., U.S.A.

### Assistant Professor

Erh-Min Lai	Ph.D., Univ. of California, Davis, U.S.A.
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## FACILITIES

The department has classrooms, laboratories and offices located on the eastern site of the second floor and the whole third floor of Building #1 as well as on the third and fourth floors of Sino-African Building. In addition to classrooms, laboratory exercise rooms, discussion rooms, conference rooms, greenhouse, herbarium and instrument rooms, the department consists of laboratories of Plant Bacteriology, Fungal Physiology, Plant Viral Disease, Applied Mycology, Cell Biology, Plant Nematology, Forest Pathology and Mycology, Plant Virology, Pollution and Plant Disease, Molecular plant Pathology, Plant-Microbe Biology and Molecular Plant Virology.

The department is well equipped for research, including temperature control equipment, sterilizing manipulation equipment, individual ventilation cage system incubator, research microscopes, phase contrast-dark field microscope, fluorescence microscope, scanning electron microscope, transmission electron microscope, microscope camera system, microtome, ultramicrotome, nucleic acid-protein analyzing equipment, ELISA reader, fluorescent spectrophotometer, PCR-thermal cycler, electroporator, pulsed field gel electrophoresis apparatus, high-speed centrifuge, ultracentrifuge, speed vacuum dryer, HPLC, FPLC.

Over 2000 books and 400 journals of the Department of Plant Pathology and Microbiology have been moved to the main library and are valuable references for students and faculty.

## COURSES

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### Undergraduate Programs

The department offers a four-year program leading to the degree of Bachelor of Science. The students must complete a minimum of 128 credits.

#### Required Course

Microbiology and Lab.(4), Mycology and Lab.(3), Plant Virology and Lab.(3), Phytopathological Nematology(3), Plant Physiology and Lab.(4), Methods in Phytopathology and Lab.(3), Biochemistry(4), Biochemistry Lab.(2), Plant Pathology and Lab.(4), Plant Disease Control(3), Genetics(3), Statistics(3), Molecular Biology(3), Applied Microbiology(3)

#### Compulsory-optional Special Course

Introduction to Plant Pathology and Microbiology, Non-infectious Plant Diseases(2), Plant Diseases and Diagnosis(3), Introduction to Agriculture(2), Plant Quarantine(2), Fruit Disease(3), Floral Pathology(2), Introduction to Forest Pathology(3), Agricultural Entomology(3), Methods in Microbiology(2), Microbial Physiology(2), Microbial Genetics(2), Plant Bacteriology(3), Ecology and Application of Mushroom(2), Agrochemicals,

Direct Research(4),

### Graduate Programs

The graduate level of the Department of Plant Pathology and Microbiology offers a 1-4 year program leading to the degree of Master of Science. The minimum requirement of credits is 24, plus 6 credits of thesis.

The Doctoral level of the Department of Plant Pathology and Microbiology offers a 2-7 year program leading to the degree of Doctor of Philosophy in Science. The minimum requirement of credits is 18, plus 12 credits of thesis.

## ACADEMIC ACTIVITIES

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1. Held open seminars related to Plant Pathology and Microbiology.
2. Sponsor the annual meetings and symposium of Phytopathological Society, Plant Protection Society and Mycological Society.
3. Held international symposium related to phytopathology and microbiology.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) Techniques for culture and manipulation of microbes
- (2) Techniques for biological and genetic engineering
- (3) Techniques for plant disease diagnosis and control
- (4) Techniques for plant health inspection and quarantine
- (5) Techniques for development and applications of chemical and bio-pesticides

### ■ Further studies

- (1) Plant Pathology
- (2) Microbiology
- (3) Botanical Science
- (4) Biotechnology
- (5) Food Science
- (6) Biological Chemistry
- (7) Cellular and Molecular Biology
- (8) Institute related to agriculture, life science and medicine.

### ■ Career options

- (1) Positions in Bureau of Animal and Plant Health Inspection and Quarantine, Agricultural Research and Extension Station, Agro-technology company etc.
- (2) Positions in companies of agricultural pesticides, biotechnology, foods, or chemical engineering.
- (3) Teaching in all levels of school.
- (4) Positions in research institute of biochemistry, molecular biology, or medicine.
- (5) Positions in institutes of biodiversity, conservation, or environmental protection.

## CONTACT INFORMATION

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Established in: 1998

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# 6. SCHOOL OF FORESTRY AND RESOURCE CONSERVATION

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## INTRODUCTION

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The Japanese Government founded National Taiwan University in 1928 under the name of “Taihaku Imperial University”. Upon the restoration of Taiwan to the Republic of China after the Second World War, the Government took over Taihaku Imperial University and renamed it as “National Taiwan University” on November 15, 1945. In 1964, the master degree was initiated and the department was subdivided into Silviculture, Forest Management, Forest Industry and Forest Botany in 1967. In 1974, the Ph.D. program was added. The subdivision of Forest Botany was renamed as Resource Conservation in 1987 and subdivision of Forest Management was renamed as Resource Management in 1991. In response to the global change of forestry education and the trend of environmental conservation, the department changed the name into “School of Forestry and Resource Conservation” in 2003 and divided the program into four divisions as Forest Biology, Forest Environment, Biology Material, and Forest Conservation and Management.

## FACULTY

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Full-time: 22

Part-time: 6

Ph. D. Degree: 28

### Chair/ Professor

Hann-Chung Lo Ph. D., NTU

### Full-time

#### Professor

Shing-Rong Kuo Ph. D., NTU

Shang-Tzen Chang Ph. D., Virginia Polytechnic Institute & State University, U.S.A.

Ya-Nan Wang Ph. D., NTU

Chinlong Zheng Ph. D., Univ. of Massachusetts, U.S.A.

Ming-Chieh Chen Ph. D., NTU

Biing-T Guan Ph. D., Univ. of Illinois (Urbana-Champaign), U.S.A.

Hsiao-Wei Yuan Ph. D., Cornell Univ., U.S.A.

#### Associate Professor

Lih-Jih Wang Ph.D., Univ. of Washington, U.S.A.

Ming-Jer Tsai Ph. D., Freiburg Univ., Germany

Chun-Han Ko Ph. D., U.C.L.A., U.S.A.



Tzung-Su Ding Ph. D., Univ. of California,  
Davis, U.S.A.

Fang-Hua Chu Ph.D., National ChungHsing  
University

Hui-Ting Chang Ph.D., NTU

#### **Assistant Professor**

Chyi-Rong Chiou Ph. D., Colorado State  
Univ. , U.S.A.

Dau-Jye Lu Ph. D., Univ. of Wales, U.K.

Erh-Yang Lu Ph. D., Univ. of Minnseota,  
U.S.A.

Far-Ching Lin Ph. D., Purdue University,  
U.S.A.

Chih-Hsin Cheng Ph. D., Cornell University,  
U.S.A.

Kuo-Fang Chung Ph. D., Washington Univer-  
sity in St. Louis, U.S.A.

Ting-Feng Yen Ph. D., North Carolina State  
University, U.S.A.

Tomonor Kume Ph. D., University of Tokyo,  
Japan.

#### **Adjunct Professors**

Hsin-Hsiung Chen Ph. D., University of Tokyo,  
Japan

Song-Yon Wang Ph. D., University of Tokyo,  
Japan

Chi-Chuan Cheng Ph. D., Pennsylvania State  
University, U.S.A.

#### **Associate Professors**

Jung-Tai Chao Ph.D., University of Geor-  
gia, U.S.A.

#### **Assistant Professors**

Chuan-Wen Pai Ph.D., NTU

Sen-Sung Cheng Ph.D., NTU

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## **FACILITIES**

### **1.Buildings**

One 4-story forestry buildings, one 2-story forest aerial-photo mensuration buildings , one 4-story forest products building and one greenhouse.

### **Research offices**

Wood physics, wood processing, wooden construction, wood chemistry, pulp and paper, erosion control, forest hydrology, forest tree breeding, tree physiology, forest soil science, forest tree techniques, forest management, forest economics, remote sensing, surveying forest harvesting, marketing of forest products, forest mensuration, tree taxonomy, plant taxonomy, forest ecology, tree anatomy, resource inventory and wildlife ecology.

### **2.Equipment**

Gas chromatography, computers, wood-working

machinery, pulping and paper making equipment, surveying equipment, chemical balance, spectroscopy, microscope, atomic absorption spectrophotometry, microtome knife sharpener, precision radiation thermometer, electric resistivity instrument, Zesis Planiert E3, jena Zesis plotter, image processor, high frequency generator digital complete visconter, compact low temperature thermostats Densimeter, heatflow meter, Dverall thermal resistance test, machine stress wave timer system, ultrasonic testing machine.

### 3. Books

The numbers of forestry-related books and journals collected in our main library are over 40,000 and 50 respectively.

## COURSES

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### Undergraduate Programs

The undergraduate program requires four years of study and a minimum of 128 semester credits. Students must complete residence and course requirements to receive a Bachelor's degree in Agriculture.

1. The required courses of the Department:
  - Calculus (General Mathematics), Introduction to Forestry, Statistics, Silviculture and Practice, Forest Products and Practice, Dendrology and Practice, Forest Management and Practice, Forest Camp. Practice, Forest Policy and Administration, Forest Ecology and Practice, Seminar.
2. The required courses of the Divisions:
  - (1) The required courses of Forest Biology Division:
    - a. The required courses:
      - General Chemistry, General Chemistry Lab., General Botany, General Botany Lab., General Zoology, General Zoology Lab.
    - b. The selective courses: (24 credits required)
      - Soil Science, Soil Science Lab., Tree Physiology, Tree Physiology Lab., Dendrology and Practice, Surveying and Practice, Plant Taxonomy, Forest Biology, Forest Soil and Lab., Plant Physiology, Plant Phyology Lab., Microbiology, Microbiology Lab., Forest Genetics and Lab., Silvology Forest Protection, Forest Nutrition, Anatomy of Tree and Lab., Genetics, Introductory to Forest Biotechnology, Introductory Biodiversity, Principles of Instrumental Analysis in Forest Chemistry, Nearly Extirpated Animals and Plants and Their Conservation, Morphology of Tree and Lab., Regional Silviculture, Physiological Ecology of Forest Tree and Lab., Wildlife Zoology, Tissue Culture of Woody Plants, Tree Improvement and Lab., Economic Trees, Monitoring Forest Environment, Introduction to Terrestrial Biogeochemistry, Ecology, Ecology Lab., Environmental Planting and Nursing, Bird Ecology and Conservation, Functions of Forest, Ecology and Management of Forest Insects, Plant Geography, Public Benefits of Forest, Tree

Mycorrhizae, River/Stream Ecology and Conservation.

(2) The required courses of Forest Environment Division:

a. The required courses:

General Physics , General Physics Lab. , General Chemistry , General Chemistry Lab. , Surveying and Practice , Forest Soil and Lab., Forest Climate and Practice, Soil and Water Conservation, Forest Hydrology.

b. The selective courses: (9 credits required)

Introduction to Geology, Geomorphology and Lab., Dendrology and Practice, Introduction to Forest Recreation, Earth and The Environment, Surveying and Practice , Forest Resource Economics, Laws and Policies of Natural Environment, Introduction to Environmental Engineering, Remote Sensing, Forest Protection, Forest Nutrition, Principles of Instrumental Analysis in Forest Chemistry, Forest Environment Conservation, Forest Engineering and Practice, Environmental Ecology and Lab., Environmental and Resource Economics, Forest Photogrammetry, Watershed Management, GEO-Information System in Forestry, Monitoring Forest Environment, Introduction to Terrestrial Biogeochemistry, AGRO-Ecological Sciences, Environmental Planting and Nursing, Functions of Forest, Plant Geography, Climate Change and Environmental Ecology, Public Benefits of Forest, Vegetation Inventory and Assessment, Tree Ring and Environmental Changes, Forest Environment Management

and Planning, Forest Ecosystem Management, River/Stream Ecology and Conservation.

(3) The required courses of Biology Material Division:

a. The required courses:

General Physics , General Physics Lab., General Chemistry , General Chemistry Lab., Wood Anatomy and Lab., Wood Adhesives and Practice, Wood Chemistry and Lab., Wood Coatings and Coating Technology, Wood Physics and Lab.

b. The selective courses: (9 credits required)

Analytical Chemistry , Analytical Chemistry Lab. , Organic Chemistry , Organic Chemistry Lab. , Biochemistry, Engineering Mathematics (I), Introduction to Architectural Design, Mechanics of Materials, Wood Identification and Grading, Introduction on Wooden Furniture Industries, Principles of Instrumental Analysis in Forest Chemistry, Wood Extractives, Computer Application and Programming, Preservation and Modification of BIO-Materials, Introduction to Traditional Wood Structures in Taiwan, Wood Seasoning, Economic Trees, Wooden Furniture Engineering, Polymer Chemistry, Wood Working Machinery and Practice, Pulp Manufacturing and Lab., Thesis (B.S.) , Design and Construction of Wood Structures(I), Paper Making and Lab., Environmental Engineering Application of Forest Product Industry, Biocomposite Material Science.

(4) The required courses of Forest Conservation and Management:

a. The required courses:  
Economics, General Botany, General Botany Lab., General Zoology, General Zoology Lab., Surveying and Practice (I), Conservation Biology.

b. The selective courses: (15 credits required)  
General Chemistry , General Chemistry Lab. , Tree Physiology, Tree Physiology Lab., Dendrology and Practice , Plant Taxonomy , Introduction to Forest Recreation, Surveying and Practice (II), Forest Resource Economics, Forest Biology, Forest Soil and Lab., Computer Science Applied in Forestry, Forest Genetics and Lab., Remote Sensing, Forest Protection, Forest Climate and Practice, Forest Nutrition, Anatomy of Trees and Lab., Genetics, Forest Resource Measurements and Inventory, Introductory Biodiversity, Social Change and Conservation, Forest Environment Conservation, Soil and Water Conservation, Nearly Extirpated Animals and Plants and Their Conservation, Environmental and Resource Economics, Forest Bionomics, Forest Photogrammetry, Forest Recreation Management, Physiological Ecology of Forest Tree and Lab., Forest Hydrology, Watershed Management, Wildlife Zoology, Tree Improvement and Lab., Economic Trees, GEO-Information System in Forestry, Monitoring Forest Environment, Introduction to Terrestrial Biogeochemistry, Environmental Planting and

Nursing, Bird Ecology and Conservation, Functions of Forest, Plant Geography, Community-Based Conservation-Discourse and Methods, Public Benefits of Forest, Vegetation Inventory and Assessment, Decision-Making in Forest Administration, Tree Ring and Environmental Changes, Wildlife Management, River/Stream Ecology and Conservation, Management of Natural Protected Areas.

### The Master of Science Programs

The master of science degree is an academic degree granted by the Graduate Institute of Forestry and Resource Conservation. Full-time students must be in-residence for one to four years and must complete at least 24 credits of appropriate courses and 6 thesis credits, and must submit an acceptable thesis based on original research. A student must fulfill all these requirements and pass thesis defense to receive a Master of Science in Agriculture. The required courses for all divisions are listed as followed:

### The Doctor of Philosophy Programs

The Graduate Institute of Forestry and Resource Conservation programs leading to a Doctor of Philosophy degree require two to seven years of study beyond the master's degree, completion of 30 semester credits, (4 special seminar credits and 12 thesis credits included), and defense of an acceptable dissertation based on original research. Graduates are accorded a Doctor of Philosophy in Agriculture.

## ACADEMIC ACTIVITIES

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1. Seminars and symposia are conducted on a non-periodical basis. Scholars and other specialists from abroad may be invited to attend such meetings to exchange ideas and information on the latest developments in forestry research and technology.
2. School of Forestry and Resource Conservation publishes the Journal of the NTU Experimental Forest and other cooperative research reports.
3. Each year, School of Forestry and Resource Conservation receives a total of about 20 research grants from the National Science Council, the Council of Agriculture, the Forestry Bureau, the Tourism Bureau and other governmental agencies.

## VISION

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About 58 percent of the land of Taiwan is covered with forests, which have been considered as extremely valuable natural resources in the country. The forests have produced a wide variety of timber products and also conserved and improved the quality of the physical environment by stabilizing stream flow, reducing soil erosion, ameliorating climate, maintaining water resource, accommodating wildlife and providing favorable sites for outdoor recreation.

In recognition of these advantages, there has been a demand for professional foresters to maintain, produce, protect, improve, manage, harvest, and utilize the forest resources for the benefits of society. A professional forester requires technical to obtain knowledge and skills for performing forestry and forest related activities. This department was therefore established to provide education and training in forestry and related sciences.

## CONTACT INFORMATION

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Established in: 1947

Chair: Hann-Chung Lo

Tel: +886-2-33664609

Fax: +886-2-23654520

Website: <http://www.fo.ntu.edu.tw>

E-mail: [forestry@ntu.edu.tw](mailto:forestry@ntu.edu.tw)

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# 7. DEPARTMENT OF ANIMAL SCIENCE AND TECHNOLOGY

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## INTRODUCTION

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This department originated in the College of Science and Agriculture, Taihoku (Taipei) Imperial University. In 1943, the College of Science and Agriculture was separated into two colleges, the College of Science and College of Agriculture. At that time, Animal Husbandry and Tropical Animal Husbandry was one of the 19 Lectureships in the College of Agriculture. In 1945, the Department of Animal Husbandry and Veterinary Medicine was placed in the College of Agriculture, National Taiwan University. In the fall of 1959, this Department was divided into Department of Animal Husbandry and Department of Veterinary Medicine. The Graduate Institute of Animal Husbandry started in 1969 with a Master program. The Ph.D. Programs began in 1981. In 1992, the Department of Animal Husbandry was renamed Department of Animal Science. In 2005, the Department of Animal Science was renamed Department of Animal Science and Technology.

The department is located in a fully integrated research park with teaching, research, practical training and leisure animal farm. Our teaching and research areas include two groups of animal science and production technology. The animal science group focuses on animal genetics, nutrition, physiology, molecular biology, and transgenic technology with research areas of animal functional genomics, regeneration biology and animal physiological regulation. The Production technology group focuses on animal breeding, feeding, farm management and milk/meat/egg processing with research areas of animal products and health, establishment of animal nutrition standards and animal production management. These two groups put teaching, research and practical training together to develop our students' theoretical competence as well as practical ability.

To keep pace with the teaching and research of the University, as well as with the future development of the College of Bio-resources and Agriculture, the teaching and research of the Department of Animal Science and Technology have expanded from the animal production related areas to animal biotechnology. We propose to establish a transgenic animal research center. To develop the teaching and research of companion and laboratory

animals, we plan to build new laboratory animal houses. The establishment of these medium- and large-sized animal research facilities for pigs, cattle, goats, dogs, chickens, and ducks will involve collaboration with the College of Medicine and the Department of Veterinary Science. Our facilities and faculty support Taipei City Zoo on wild animal feeding and management research and help the Animal Husbandry Division of the university Agriculture Research Farm to plan research projects. The overall goal is to establish a molecular farm. The areas of research and teaching evolved in the Department of Animal Science and Technology are not limited to the field of traditional animal husbandry, but also include the field of molecular biology. Therefore, biotechnology-trained graduates from this department will contribute to the industry.

## FACULTY

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Full-Time: 20

Part-Time: 4

Ph.D. Degree: 24

M.S. Degree: 0

### Chair/ Professor

Jih-Tay Hsu                      Ph.D., University of Illinois

### Full-Time

#### Professor

Bao-Ji Chen                      Ph.D., Cornell University

Ning-Sun Yang                      Ph.D., Michigan State  
University

Leang-Shin Wu                      Ph.D., NTU

Hou-Pin Su                      Ph.D., NTU

Ming-Ju Chen                      Ph.D., Ohio State University

Shih-Torng Ding                      Ph.D., Ohio State University

#### Associate Professor

Chu-Ying Chyr Lou                      Ph.D., Iowa State University

Mei-Fong Lin                      Ph.D., NTU

Yan-Nian Jiang                      Ph.D., NTU

De-Shien Jong                      Ph.D., University of Cincinnati

Yo-Tein Ju                      Ph.D., National Yang-Ming  
University

#### Assistant Professor

Hen-Wei Wei                      Ph.D., University of  
Aberdeen

Shinn-Chih Wu                      Ph.D., NTU



En-Chung Lin	Ph.D., Iowa State University
Pei-Hwa Wang	Ph.D., NTU
Chiu-Hsien Chiu	Ph.D., NTU
Je-Ruei Liu	Ph.D., NTU
Ching-Yi Chen	Ph.D., Texas A&M University
I-Hsuan Liu	Ph.D., North Carolina State University

### Part-time

#### Professor

Hui-Shen Lin	Ph.D., Iowa State University
Simon S.P. Chi	Ph.D., University of Mississippi

#### Associate Professor

Keh-Sheng Chang	Ph.D., NTU
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#### Assistant Professor

Chung-Ping Ho	Ph.D., Louisiana State University
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## FACILITIES

The Department consists of nine Laboratories of Animal Breeding, Animal Physiology, Genetics and Animal Production, Animal Nutrition, Poultry Nutrition, Hygiene of Animal Product, Farm Management, Chemistry and Technology of Milk, Meat Products and Molecular Biology. Currently, the Department has animal husbandry building, animal product plant, milk-processing plant, feed mill and animal farm for teaching and research.

The Department has many analysis and farm equipments. The library holds more than 1,500 textbooks and more than 70 titles of periodical journals in Chinese, English and Japanese. The computer room is equipped with 6 personal computers, a jet printer and a laser printer.

## COURSES

### Undergraduate Programs

The required courses are divided into animal science and production technology groups. The animal science group includes courses of biotechnology, reproduction physiology, and genetic nutrition. The production technology group covers breeding and statistics, farm management and functional product processing areas. The undergraduate student has to choose courses of a specific group according to his/her interest and future career plan.

Undergraduate students in our department have to take at least 128 credits (including 12 credits of general required courses, 79(78) credits of departmental required courses, 18 credits of general education courses, and 19(20) credits of elective courses) for the B.S. degree of agriculture, which usually takes 4 years. The 79(78) credits of departmental required courses include 50 credits of professional required courses and 29(28) credits of group required courses. The required courses are listed below:

**Professional required courses (50 credits)**

**First year:** General Chemistry (C) and Lab.(4), Organic Chemistry and Lab.(4), Anatomy and Physiology of Animals and Lab.(6), Statistics(3), Introduction of Animal Science and Technology(2)

**Second year:** Biochemistry (B) and Lab.(6), Genetics and Lab.(4), Logic and Methodology(3), Animal Nutrition Lab.(4)

**Third year:** Poultry Production(3), Dairy Animals(3), Farm Practice(1)(1), Meat Animals(3), Livestock Farm Practice(2)(1)

**Fourth year:** Farm and Laboratory Practice (1), Experiment Animals (2)

**Animal Science Group required courses (28 credits)**

**Second year:** Animal Cell Biology(2), Animal Reproduction(3)

**Third year:** Animal Digestive Physiology (2), Molecular Biology (4), Animal Cell Culture and Preservation (2), Animal Endocrinology (3), Animal Metabolism (3)

**Fourth year:** Developmental Biology (3), Biotechnology (3), Introduction of Genomics (2), Introduction of Bioinformatics (2)

**Production Technology Group required courses (28 credits)**

**Second year:** Animal Breeding (3), Feedstuffs (2), Chemistry of Animal Products (2)

**Third year:** Dairy Technology and Lab.(3), Meat Technology and Lab.(3), Farm Animal Behavior and Welfare(2), Environmental Physiology of Animals(2), Automation of Animal Production(2)

**Fourth year:** Animal Health (2) Companion Animals(2), Animal Products Processing Plant Management (2), Management of Animal Resources(3)

**Graduate Programs**

The graduate program of 1-4 years for a Master of Science degree is divided into majors in Animal Science (required courses: Seminar 4 credits, Research Methods of Animal Science A 3 credits, Thesis Writing 2 credits, M.S. level courses in this department 9 credits) and in Production Technology (required courses: Seminar 4 credits, Research Methods of Animal Science B 3 credits, Thesis Writing 2 credits, M.S. level course in this department 9 credits). Students will be granted the Master of Science degree after taking 24 credits of required and optional courses, submitting the research thesis and passing the oral defense.

Graduate program of 2~7 years for a Doctor of Philosophy degree requires seminar 4 credits, the Ph.D. level courses in this department 6 credits. Students will be granted Doctor of Philosophy degree after taking 18 credits of courses, passing the second exam of GEPT High-Intermediate level test (or other equivalent English proficiency test), passing the qualified exam, submitting the research thesis and passing the oral defense.

## ACADEMIC ACTIVITIES

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The Department invites experts to give seminars and speeches, hosts feed manufacturing technology proceedings and feed microscopic examination technique training courses, and extension service for animal productions and technology. Many of our faculties are invited to be review committee members in the National Science Council and the Council of Agriculture, Chinese National Standard technique committee members, technique examination committee members of National Animal Industry Foundation and Taiwan Grains and Feeds Development Foundation. Our faculty also are involved in the examination of CAS meat products, on-farm evaluation of Good Practice Pig and Cow farm as well as those extension education and training program for poultry, market pigs, dairy cow and processing products of livestock, which provided great assistance to the development of the industry. Faculty members are also actively involved in various research projects supported by National Science Council, Council of Agriculture, Department of Health and National Animal Industry Foundation, in the past four years, 130 projects were funded about NT\$150 million, and 110 papers were published in SCI journals.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) Animal raising and reproduction
- (2) Animal nutrition and feed formulating
- (3) Chemical analysis
- (4) Food processing (milk, meat, egg)
- (5) Biomedical and genetic engineering
- (6) Animal genetic and breeding
- (7) Animal physiology and endocrinology
- (8) Management and statistical analysis
- (9) Computer science
- (10) Biotechnology, gene transfer, animal cloning

### ■ Further studies

- (1) Nutrition, animal feeding and management
- (2) Processing, food science and technology
- (3) Physiology, genetic and breeding
- (4) Biostatistics
- (5) Food microbiology
- (6) Molecular biology, genetic engineering
- (7) Biotechnology
- (8) Farm management

### ■ Career options

Animal science technician, dietician, teacher, researcher, farm staff, research and development specialist and quality controller, feed and animal drug salesman, zoo technician, environment technician, animal industry management, animal industry related government official.

## CONTACT INFORMATION

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Established in: 1946

Chair: Jin-Tay Hsu

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# 8. DEPARTMENT OF AGRICULTURAL ECONOMICS

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## INTRODUCTION

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### History of Department of Agricultural Economics

The history of our department can be traced back as early as to the year 1928 (A.D.), when a series of lectures on agricultural economics took place along with the establishment of Taihoku Imperial University during the time of Japanese colonization. In 1950, with the termination of Japanese colonization, the previous Taihoku Imperial University was renamed National Taiwan University; in the same time the School of Agriculture, together with the Department of Agricultural Economics, was set up. Initiated from 1960, our department has a history of 80 years, with the number of our graduates totalling over 1,800. In 1960, in accordance with the need of agricultural development of our country, we founded the graduate program of Rural Society and Economics, nurturing graduate students at master's level. In 1970, the program was renamed Graduate Program of Agricultural Economics; in 1987, the PhD program was

founded with the purpose of fostering advanced scholars in agricultural economics. Since then, our department has become the prestigious institution

on teachings and researches in agricultural economics.

The purposes of inaugurating our institution include developing scholars and talented people in advanced agricultural economic studies, corresponding to modern agricultural constructions of our country, and aiming for teaching and researching at world class level. Until 2008, the number of graduates with master's degree is 520, and with PhD degree is 56. There are numerous people nurtured by the Department of Agricultural Economics working in the fields of politics, agriculture, construction, and business. Besides the alumni serving in the politics, other alumni, currently apply their studies to their services in agriculture, construction, business, and finance, have also contributed immensely to the society as well as to the country.

### Goals of Teaching and Researching

To correspond to the purposes and goals of our department, the pedagogical direction of our undergraduate and master programs is to equip students with basic knowledge in economics, accounting, statistics, agricultural and environmental resources, agricultural transportation and marketing, and agricultural policies. It also seeks

to strengthen their reading abilities in preparation for new knowledge after graduating from the program, when they enter the society. The pedagogical direction of our PhD program, furthermore, is to strengthen students' ability to read periodicals of the world's top level, to prepare them for independent individual developments and to possess creative abilities, so that they can become advanced research scholars in human sciences. Moreover, according to the research interests and specialties of the faculties, the department's researches can be divided into four main directions: 1. Policy, Regulation and Legislation, 2. Transportation, Trade, and Consumption; 3. Production and Managerial Economics, 4. Resource and Environment Economics. Such division not only is closely associated with current agricultural economic problems of our country, but also presents outstanding academic performances in each field of research.

### **Future Perspectives**

Currently the only Department of Agricultural Economics in our country, our department has an outstanding tradition as well as stable foundations in research and development. During this time when agricultural development in our country is facing significant challenges and transformations,

our department cannot help but be responsible for agricultural developments and transformations of our country. In this new era, we must emphasize on the promotion of industrial competitiveness, promoting the function and efficiency of agriculture in aspects of production, life, and ecology. As a consequence, our department seeks for a transformation according to such request and mission. In future terms, we will focus on three directions for prospective development: agricultural production development and agricultural business administration, resource and environment economics, and researches on agricultural policies. With these three points in mind, our department aims to improve teaching and researching with the purpose of nurturing exceptional alumni to help with agricultural transformation and to increase agricultural competitiveness, fulfilling the ideal of "global vision, local thinking" ("glocalization"). Our department attempts to follow the examples of top programs abroad with a frame to catch up in five years. Through relevant researches and international cooperation, we hope to cultivate our department as a significant repository of knowledge in agricultural policy studies and agricultural development in our country.

## FACULTY

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The Department of Agricultural Economics has twenty-seven faculty members, sixteen of them are full-time and the rest are part-time. Twenty-six of the faculty has a Ph.D. degree in Agricultural Economics or related fields.

### Chair/ Professor

Shih-Hsun Hsu      Ph.D. in Economics, Texas A & M University, U.S.A.

Areas of Interest:    C.G.E Models, Resource and Environment Economics, International and Agricultural Trade.

### Full-Time

#### Professors (in alphabetic order)

Yu-Hui Chen      Ph.D. in Agricultural Economics, University of Wisconsin at Madison, U.S.A.

Areas of Interest:    Fishery Economics, Agricultural Marketing, Agricultural Trade.

Jerome Geaun      Ph.D. in Economics, University of Vanderbilt, U.S.A.

Areas of Interest:    Welfare Economics, Environment Economics, Economic Development.

Li-Fen Lei      Ph.D. in Agricultural Economics, Iowa State University, U.S.A.

Areas of Interest:    Statistics, Derivatives, Agricultural Marketing, Fallow Agribusiness.

Kuo-Ching Lin      Ph.D. in Economics, North Carolina State University, U.S.A.

Areas of Interest:    Analysis, Land Economics, Agricultural Policy Analysis, Resource Economics, Econometrics.

Alan Yun Lu      Ph.D. in Agricultural Economics, Texas A & M University, U.S.A.

Areas of Interest:    Resource Economics, Institutional Economics, Agricultural Finance, Chinese Agriculture.

Yir-Hueih Luh      Ph.D. Agricultural Economics, Pennsylvania State University, U.S.A.

Areas of Interest:    Production Economics, Applied Econometrics, Industrial Studies.

Rhung-Jieh Woo      Ph.D. in Economics, Iowa State University, U.S.A.

Areas of Interest:    Agricultural Trade, Agricultural Finance, Agricultural Policy Analysis, International Marketing for Agricultural Products.

Pei-Ing Wu      Ph.D. in Agricultural Economics and Rural Sociology, the Ohio State University, U.S.A.



Areas of Interest: Applied Welfare Economics, Applied Econometrics, Environment Economics. Environmental and Resource Economics, Applied Consumer Economics, Resource Economics, Applied Econometrics.

Ching-Cheng Chang Ph.D. in Agricultural Economics, Pennsylvania State University, U.S.A.

Areas of Interest: Agricultural Production, Agricultural Policy, Quantitative Methods, Productivity Efficiency Analysis, (jointly appointed with the Institute of Economics, Academia Sinica)

Tsu-Tan Fu Ph.D. in Agricultural Economics, University of Georgia, U.S.A.

Areas of Interest: Consumer Economics, Econometrics, Productive Efficiency Analysis, Higher Education Productivity . (jointly appointed with the Institute of Economics, Academia Sinica)

#### **Associate Professors (in alphabetic order)**

Cheng-Wei Chen Ph.D. in Agricultural Economics, Washington State University, U.S.A.

Areas of Interest: Fishery Economics, Biology Economics, Agricultural Marketing.

Fang-Mei Huang Ph.D. in Economics, University of Wisconsin-Madison, U.S.A.

Areas of Interest: Demographic and Labor Economics, Econometrics, Health Economics.

Lih-Chyun Sun Ph.D. in Agricultural Economics, Michigan State University, U.S.A.

Areas of Interest: Environment and Resource Economics, Econometrics, Production Economics.

#### **Assistant Professors (in alphabetic order)**

Hung-Hao Chang Ph.D. in Applied Economics and Management, Cornell University, U.S.A.

Areas of Interest: Applied Microeconomics, Agricultural Household Model, Risk and Uncertainty.

Chu-Ping Lo Ph.D. in International Economics, University of California, Santa Cruz, U.S.A.

Areas of Interest: International Trade, Policy Economics, Economic Growth.

#### **Emeritus Professors**

Wen-Fu Xu Ph.D. in Agricultural Economics, Pennsylvania State University, U.S.A.

Areas of Interest:	Agricultural Policy, Agricultural Marketing		Agricultural Finance, Mar- keting and Management.
Hsi-Huang Chen	Ph.D. in Agricultural Eco- nomics, University of Geor- gia, U.S.A.	Fu-Shan Liu	Ph.D. in Agricultural Eco- nomics, University of Illi- nois, U.S.A.
Areas of Interest:	Agricultural Development and Policy.	Areas of Interest:	Agricultural Marketing, Agricultural Finance, Agri- cultural Policy.
Ming-Chien Chen	Ph.D. in Economics, Utah State University, U.S.A.		
Areas of Interest:	Resource and Environment Economics, Agricultural Economics, Fishery Eco- nomics.		
Chiang-Ren Show	Ph.D. in Agricultural Eco- nomics, Purdue University, U.S.A.		
Areas of Interest:	Agricultural Marketing, Agricultural Price, Food Problems.		
Shun-Cheng Lee	Ph.D. in Applied Econom- ics, University of Min- nesota, U.S.A.		
Areas of Interest:	Resource Economics, International Trade, Price and Marketing, Economic Development.		

### Part-Time

#### Professors (in alphabetic order)

Chin-Jung Huang	Ph.D. in Agricultural Eco- nomics, Goettingen Univer- sity, German.		
Areas of Interest:	Agricultural Policy,		
		<b>Associate Professors(in alphabetic order)</b>	
		Wu-Hsiung Cheng	Ph.D. in Agricultural Eco- nomics, University of Illi- nois, U.S.A.
		Areas of Interest:	Agricultural Policy, Agribusiness Management, Trade and Negotiation.
		Chin-Hui Huang	Ph.D. in Economics, Chi- nese Cultural University, Taiwan, Post-Doctor in Eco- nomics, Oxford University, UK.
		Areas of Interest:	International Trade Theory and Policy, Monetary The- ory and Policy, Technology Management, Economic Growth and Policy.
		Pai-Po Lee	Ph.D. in Industrial Planning (Divison of Agriculture), Chinese Cultural University, Taiwan.
		Areas of Interest:	International Agriculture, International Development and Cooperation, Human Resource Development.

Kao-Chao Li	M.S. in Economics, University of Vanderbilt, U.S.A.
Areas of Interest:	Macroeconomic Analysis, Economic Development, Energy and Production.
Chea-Yuan Young	Ph.D. in Agronomy, NTU Areas of Interest: Environmental Planning and Management, Meteorology, Air Pollution Control.

## FACILITIES

### Research Facilities

NTU Agriculture Composite Science Building was constructed in 1988, and the Department of Agricultural Economics is located in the first, the second floor and the basement, occupying 1,200 acres. The first floor contains Agricultural Economics Auditorium, AGECE Classroom II, study rooms for master students, seminar rooms, the AGECE library, and a Computer Center within the library. The second floor contains conference rooms, administration offices, faculties' offices, study rooms for PhD students, and a public reception room. In the basement there are AGECE Classrooms IV, and V, library stack room, study rooms for master students, office of student association and a student affiliation room. Among them, AGECE Auditorium, AGECE Classroom II, seminar rooms, Computer Center and conference rooms all consist of modern audio facilities. The comprehensive teaching facilities provide an

exceptional environment for teaching and researching.

As for the Computer Center, our Computer Center has been equipped with the state of the art technology and networking facilities since 1991. Not only does our program have our own regional network, software like Microsoft Windows XP Professional, Microsoft Office 2003 and 2007, statistical and calculating software like SAS, Stata, Limdep, Shazam, Gauss, Eviews, Matlab, Gams, etc., can be accessed by faculties and students in the Computer Center. On the one hand, the connection to NTU intercampus network, through NTU Computer and Information Networking Center, can link to T1 education network of Education Bureau, and then to the entire internet in search of worldwide information. On the other hand, our department has a working station used for the purpose of making information website public and accelerating the speed of information transfer. Email accounts are also open to be applied for, so that the working station can be properly used by faculties and students of the department. On the part of personal computers, there are currently 25 personal computers, equipped with processors over Pentium 4 3.0, for students to practice statistical and quantitative software, search information, and produce topical reports and presentations.

### Library Facilities

The Department of Agricultural Economics has an AGECE library to correspond to faculties' needs for

teaching and researching, as well as graduate and undergraduate students' referential needs. It collects books and periodicals widely on agricultural economics, economics, statistics, environment and resource economics, accounting, finance, money and banking, international trade, land economics, agricultural policy, farmland management, etc. Other materials like collections of conference papers, research papers and reports, and many kinds of periodicals are all parts of the library collection. Current library collection is over 6,000 in total, among which 1/3 is in English, and 2/3 in Chinese and Japanese. Furthermore, the AGECE library has a collection of yearly theses and dissertations, overdue periodicals, as well as research reports and books contributed by research organizations, alumni and faculties.

### Teaching Facilities

To increase the quality of teaching and researching, the renewal and provision of apparatus and facilities have been under special attention. Recently updated teaching facilities include projectors, notebooks, digital cameras, digital video camera, etc. The previous traditional mechanical fax and copy machines have been replaced by digital ones, thus elevating the efficiency and quality of teaching, researching, and administration. Moreover, the department allots considerable budget for the renewal of hardware facilities in each faculty's office for the maintenance of the entire research environment. Most Computer facilities in faculties' offices are multimedia ones equipped with Pen-

tium 4 processors or above; such hardware facilities considerably benefit the teaching and researching qualities of our program.

## COURSES

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### Undergraduate Programs

The department offers a four-year program leading to the degree of Bachelor of Science in Agricultural Economics. Students must complete at least 130 credits.

### Required Courses

Introduction to Agricultural Economics (2 credits), Introduction to Agricultural Economics (2 credits), Principle of Economics (6 credits), Accounting (6 credits), Hand-on Experience of Modern Agriculture (2 credits), Farm Crops (3 credits), Animal husbandry (3 credits), Statistics (6 credits), Experience of modern Agricultural Policy (2 credits), Microeconomics (6 credits), Macroeconomics (6 credits), Farm Management (3 credits), Agricultural Marketing (3 credits), Agricultural Prices (3 credits), Agricultural Finance (3 credits), Environmental and nature resource Economics (3 credits), Agricultural Regulations (3 credits), Agricultural Development (3 credits), Agricultural Policy (3 credits), Seminar on Agricultural Economic Problems (4 credits)

## Graduate Programs

Students can pursue Master of Science (M.S.) or Doctor of Philosophy (Ph.D) degrees. The minimum requirement for the Master degree is twenty-eight credits, not including the six credits of M.S. Thesis. Students must fulfill the requirement of minimum credits and a thesis before the end of the fourth year in the program. The tentative requirements for the Ph.D. degree in Agricultural Economics are two to seven years of enrollment and the completion of at least forty-six credits, not including the twelve-credit doctoral dissertation.

The Graduate Institute offers four fields of specialization including (1) Agricultural Policy, Institution and Regulations, (2) Agricultural Marketing, Trade and Consumption, (3) Agricultural Production Economics and Management, and (4) Agricultural Resources and Environmental Economics. Students in the Ph.D. program are required to select two fields of specialization, and to take three courses for each field. M.S. students, although not limited to select an area of specialization, are required to take any three field courses.

## Master Required Courses

Microeconomic Theory (6 credits), Macroeconomic Theory (3 credits), Research Methodology (3 credits), Applied Econometrics (3 credits), Seminar (2 credits), Seminar on Special Topics (0 credit)

## PHD Required Courses

Special Topics on Microeconomics (3 credits), Special Topics in Macroeconomics (3 credits), Special Topics on Mathematical Programming Modeling (3 credits), Econometrics (3 credits), Seminar (2 credits), Seminar on Special Topics (0 credit)

## ACADEMIC ACTIVITIES

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1. Seminars relate to agricultural economic policy and development issues are held several times each semester.
2. Inviting speeches given by the government staff and domestic and foreign experts.
3. Staff take part in domestic and international conferences, and participate in various international researches.
4. Publish Academic Periodical Journal of Agriculture and Economics every half a year.

## CAREER AND ADVANCED STUDY

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### ■ Professional skills

- a. Economics, statistics, and accounting
- b. Agricultural finance
- c. Agricultural trade
- d. Agricultural marketing
- e. Agricultural business management
- f. Agricultural policy and development
- g. Agricultural production and management
- h. Environment and resource administration

### ■ Advanced studies

Graduate programs or advanced overseas programs related to economics, statistics, accounting, finance and business management.

### ■ Career objectives

Business, finance, calculating department of insurance companies, civil services (in agricultural and political institutions, Council of Economic Planning and Development, Directorate-general of Budget, etc.), education, Farmers' and Fishermen's Association.

## CONTACT INFORMATION

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Established in: 1928

Chair: Shih-Hsun Hsu

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# 9. DEPARTMENT OF HORTICULTURE

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## INTRODUCTION

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In its previous incarnation, the Department of Horticulture was the "Horticultural Schoolroom" of the Agricultural Division in Taipei Imperial University; it became the Department of Horticulture in 1945. To our students, we offer specialized teaching, precision equipment, complete training courses and sophisticated horticulture research units.

## FACULTY

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Full-time: 23

Part-time: 16

Ph.D. Degree: 35

M.S. Degree: 3

Bachelor's Degree: 1

### Chair/ Professor

Yann-Jou Lin Ph.D., Northwestern Univ.

### Full-Time

#### Professor

Tzong-Shyan Lin Ph.D., UC Davis

Yann-Jou Lin Ph.D., Northwestern Univ.

Pung-Ling Huang Ph.D., Koeln Univ.

Yuan-Tay Shyu Ph.D., North Carolina State Univ.

Yu-Sen Chang Ph.D., NTU  
Der-Ming Yeh Ph.D., Nottingham Univ.  
Chun-Yen Chang Ph.D., Univ. of Pennsylvania  
Hsiao-Fung Lo Ph.D., Mississippi State Univ.

#### Associate Professor

Tsu-Tsuen Wang Ph.D., UC Davis  
Tsu-Liang Chang Ph.D., NTU  
Loong-Sheng Chang Ph.D., Michigan State Univ.  
Wendy Wen-Ju Yang Ph.D., Purdue Univ.  
Iou-Zen Chen Ph.D., NTU  
Jocelyn Shing-Jy Tsao

Ph.D., Univ. of Hawaii

Fu Sheu Ph.D., NTU

Yi-Yin Do Ph.D., NTU

#### Assistant Professor

Hou-Nan Tsai Ph.D., NTU

Yao-Chien Chang Ph.D., Cornell Univ.

Chun-Ta Wu Ph.D., UC Davis

Kuo-Tan Li Ph.D., Cornell Univ.

Hui-Mei Chen Ph.D., NTU

Chia-Kuen Cheng Ph.D., Texas A&M Univ.

#### Lecturer

Jung-Huei Hsu M.S., NTU

### Part-Time

#### Professor

Der-Lin Ling B.S., NTU

Nean Lee	M.S., Cornell Univ.
Albert C. Tsao	Ph.D., Univ. of Wisconsin
Cheng-Yung Cheng	Ph.D., Justus Liebig Univ.
Doris C.N. Chang	Ph.D., Utah State Univ.
Chou-Tou Shii	Ph.D., Oregon State Univ.
Ching-Lung Lee	Ph.D., Hannover Univ.
Hsiao-Lin Wang	Ph.D., Univ. of London

**Associate Professor**

Ming-Jen Sheu	Ph.D., Univ. of Maryland
Sz-Reng Chen	Ph.D., Michigan State Univ.
Min-Tze Wu	Ph.D., Colorado State Univ.
Kai-Hsien Chen	Ph. D., Maryland State Univ.

**Assistant Professor**

Wen-Chin Huang	Ph.D., NTU
Weng-Sheng Tzeng	Ph.D., NTU
Yu- Shan Liu	Ph.D., NTU

**Lecturer**

Her-Ching Wang	M.S., UC Berkeley
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**FACILITIES**

The Department and Graduate Institute of Horticulture occupy four buildings, namely: Horticultural Science Hall, Floriculture Hall, Horticultural Crops Processing Building, and Landscape Horticulture Hall. The Department has laboratory located in the greenhouse annex. located in the Isotope Research Building and the greenhouse annex. Major teaching and research laboratories cover various specialized fields, including horticultural crop physiology, genetics, breeding, electron microscopy, tissue culture, molecular biology, isotope technique, postharvest physiology, processing, and landscape horticulture. Besides these laboratories, the Department also has a landscape design studio, refrigerated storage, pilot processing plant, common and automatic greenhouses, experimental farms, etc. for teaching and research. All laboratories are equipped with up-to-date scientific instruments. The larger instruments include a scanning electron microscope, gas chromatograph, HPLC, ultrafiltration, liquid scintillation spectrometer, ultra-centrifuge/ Beckman photosynthesis system, several sets of tissue culture facilities, UV-VIS, Fluorescence spectroscopy, Micro Refrigerated Centrifuge, freeze dryer, Fluorescence dissecting microscope, Flow cytometry,

IVC system, fruit juice concentration and flavor compound recovery system, microscope and projector set, HR 2500 hybrid recorder, etc.

## COURSES

The goals of undergraduate and graduate education of the Department include training top quality research horticulturists, extension horticulturists, horticultural teachers and administrators, and production and management specialists for the horticultural industry. Typical undergraduate students complete a B.S. degree in four years with a minimum of 128 credits. Graduate students are divided into three divisions, namely: horticultural crops science division, postharvest horticulture and processing division, and landscape horticulture division. M.S. students complete the degree in two to four years with a minimum of 24 credits of courses and 6 credits of thesis research. Ph.D. students complete the degree in 3 to 7 years with a minimum of 18 credits of courses and 12 credits of thesis research. Completion and successful defense of a thesis is also required for an M.S. or Ph.D. degree.

The minimum 128 credits of undergraduate courses includes 24 credits of general science and humanities, 51 credits of basic plant and horticultural sciences, 31 to 35 credits of specialized courses and 9 to 9 credits of elected courses required by the "Concentration group." There are

five concentration groups: horticultural crops group, biotechnological group, horticultural crops processing group, landscape horticultural group and combination group, for students to choose from according to their special interest. Each student has to complete required courses in at least one concentration group for graduation. Besides those required courses, students are free to take many elective courses offered by the Department, or by other departments within or outside of the College of Bio-resources and Agriculture.

### The Required Courses

Calculus (General mathematics) (B)(6), General Botany & Lab.(B)(4), General Chemistry & Lab.(C)(4), General Physics (D)(2), Statistics(3) or Biostatistics(3), Principles of Horticulture(3), Pomology (3), Olericulture(3), Floriculture(3), Landscape Gardening & Lab.(3), Postharvest Technology of Horticulture Crop & Lab.(3), Processing of Horticulture Crop & Lab.(3), Horticulture Technology(4), Prospects of Horticulture Science(2), Plant Protection (3), Research(2)

### The Required Courses and Elected Courses of Horticultural Crops Group

#### 1.The Required Courses of Concentration

Group(31): Seminar(2), Organic Chemistry & Lab.(4), Outlines of Biochemistry(4), Biochemistry Lab.(2), Analytical Chemistry & Lab.(4), Plant Physiology & Lab.(4), Genetics & Lab.(4), Horticultural Plant Breeding & Lab(4), Plant Propagation & Lab.(3)

## 2.The Elected Courses of Concentration

Group(6): Physiology of Horticultural Crops(3), Ecophysiology of Horticultural Crops(3), Evergreen Fruits and Lab. (I) (3), Evergreen Fruits and Lab.(II)(3), Deciduous Fruit(II)(3), Growth and Development of Vegetable Crops (2), Woody Ornamental Plants(3), Herbaceous Ornamental Plants(3), Protected Horticulture(I)(2), Protected Horticulture (II)(3).

## The Required Courses and Elected Courses of Biotechnology Group:

### 1. The Required Courses of Concentration

Crops(33): Seminar(2), Organic Chemistry & Lab.(4), Outlines of Biochemistry(4), Biochemistry Lab.(2), Analytical Chemistry & Lab.(4), Plant Protection(3), Plant Physiology & Lab.(4), Genetics & Lab.(4), Microbiology & Lab.(3), Introduction to Biotechnology(2), Fundamentals of Plant Molecular Biology(3)

### 2.The Elected Courses of Concentration

Group(3): Recombinant DNA Technology(3), Immunoassay Technology (3), Plant Gene Transfer(3)

## The Required Courses and Elected Courses of Horticultural Crops Processing Group

### 1.The Required Courses of Concentration

Group(29): Seminar(2), Organic Chemistry & Lab.(4), Outlines of Biochemistry(4), Biochemistry Lab.(2), Analytical Chemistry & Lab.(4),

Plant Protection(3), Processing of Horticultural Crops (II) & Lab.(3), Analysis for Horticultural Products & Lab.(3), Microbiology & Lab.(3), Food Chemistry (3).

## The Required Courses and Elected Courses of Landscape Horticultural Group

### 1.The Requires Courses of Concentration

Group(34): Landscape Drawing & Rendering(2), Landscape Basic Design(2), Landscape Design & Practice (I)(3), Landscape Design & Practice(II)(3), Landscape Design & Practice(III)(3). Graduation Design(I)(1), Graduation Design (II)(2), Landscape Ecology(3), History of Landscape(2), Landscape Engineering and Practice(I)(3), Landscape Engineering and Practice(II)(3), Landscape Profession Practice(2). Landscape Architecture(2)

### 2.The Elected Courses of Concentration

Group(6): Landscape Management and Maintenance(3), Planting Design & Lab.(3), Computer Application in Landscape Architecture(3), Computer-Aided Landscape Design(3), Computer-Aided Landscape Simulation and Visualization(3), Geographic Information System Application In Resource Management(3), Intern-ship(3), Site Planning(2), Park and Recreation Planning(3), Principles on Landscape Planning(2), Theories of Landscape Architectural Design(3), Ecological Design(3), Woody Ornamental Plants(3), Revegetation Techniques for Special Environments(3),

Turfgrasses and Ground Covers(3), Herbaceous Ornamental Plants(3), Principles of Nursery Management(3), Foliage Plants(3), National Park Planning and Management(3).

## ACADEMIC ACTIVITIES

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Besides sponsoring the "Annual Conference of the Chinese Society for Horticultural Science," the Department frequently holds seminars on various topics relevant to horticultural sciences. Scholars and experts on or off campus are often invited as speakers. Undergraduate and graduate student associations of horticulture often sponsor educational activities, such as "horticultural week," horticultural camp, and horticultural study tours, either domestic or overseas. Faculty members are actively engaged in research, extension, and consulting activities and in organizing national and international seminars or workshops. Students are often involved in those activities. Extramural grants for those activities most often come from the National Science Council, Council of Agriculture, and Environmental Protection Agency.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) Physiology and ecology of horticultural crop
- (2) Horticultural crop culture
- (3) Horticultural crop improvement and biotechnology
- (4) Horticultural crop postharvest (Including physiology, transportation, preservation)
- (5) Horticultural crop processing and utilizing
- (6) Landscape (Garden design)

### ■ Further studies

Horticulture, Botany, Biochemistry, Microbiology, Landscape, Building and Planning, Agronomy, Agricultural Chemistry, Plant Pathology, Forestry, Biotechnology, Environmental Engineering, Agricultural Economics, Food Science and Technology, Agricultural Extension, Information Engineering, etc.

### ■ Career options

Teacher (professor of university and college, teacher of agricultural school and the middle school, etc.), Scientific Researcher, Civil Servant and Technical Staff, Biotechnology, Extension Worker, Horticulture Industry Managerial Personnel, Processing Technician, Agricultural Product's Technician, Landscape Designer, Garden Designer and Horticulture Entrepreneur.

## CONTACT INFORMATION

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Established in: 1945

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# 10. DEPARTMENT OF BIO-INDUSTRIAL MECHATRONICS ENGINEERING

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## INTRODUCTION

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The domain of bio-industry covers various fields, such as medical health care, pharmaceuticals, environment conservation, biological materials, agriculture, foods, and so on. The “Bio-Industrial Mechatronics Engineering” (BIME) program integrates engineering disciplines, such as Mechanics, Electronics, Computer Science, Automatic Control, and Chemical Engineering with applications to bio-industry. BIME can upgrade the competitiveness and automation level of bio-industry and lay the important engineering foundation for the bio-industry in Taiwan. BIME focuses on fulfilling the demand of mechatronics system integration for traditional and emerging bio-industries. In this regard, BIME serves as a department of multi-engineering disciplines (graduates are granted engineering degrees), and is involved in developing bio-mechatronics technologies including automation, bio-engineering, bio-sensor, bio-signal processing, intelligent control, Nano-BioMEMS, biomaterials, bio-informatics, bio-reactor engineering, etc., to keep abreast with the global trend of industrialization and automation in the domain of bio-industry.

## FACULTY FACULTY AND PERSONNEL

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Full-time : 22

Part-time : 1

Ph.D.Degree : 23

### Department Chairman

Ta-Te Lin Ph.D., Cornell University

### Emeritus Professors

Yi-Luen Chen Ph.D., Texas A&M University

Hang-Sun Chang Ph.D., North Carolina University

Din-Sue Fon Ph.D., Iowa State University

### Professors

Jai-Tsung Shaw Ph.D., University of Saskatchewan

Fu-Ming Lu Ph.D., University of California at Davis

Sen-Fuh Chang Ph.D., University of California at Davis

Suming Chen Ph.D., University of California at Davis

Yuan-Nan Chu Ph.D., Texas A&M University

Jyh-Cherng Shieh Ph.D., National Taiwan University

Jui-Jen Chou Ph.D., University of California at Los Angeles



Wei Fang Ph.D., Rutgers University

Joe-Air Jiang Ph.D., National Taiwan University

### **Associate Professors**

Yeun-Chung Lee Ph.D., University of Massachusetts

Chu-Yang Chou Ph.D., University of Florida

Yew-Shing Ouyang Ph.D., Purdue University

Chung-Kee Yeh Dr.-Ing., Tech. University of Berlin

Ri-Chie Chen Ph.D., Kyushu University

Chien-Yu Chen Ph.D., National Taiwan University

### **Assistant Professors**

Tzong-Jih Cheng Ph.D., National Cheng Kung University

Lin-Chi Chen Ph.D., National Taiwan University

Chen-Kang Huang Ph.D., Univ. of California at Berkeley

Cheng-Ying Chou Ph.D., Rice University

Kuo-Chi Liao Ph.D., University of Michigan,

Yen-Wen Lu Ph.D., University of California at Los Angeles

### **Part-time Assistant Professors**

Chih-Huang Ho Ph.D., Rice University

### **Teaching Assistants**

Ching-Yen Yang

### **Technicians**

Ching-Lung Huang

Chin-Fa Lee

Wan-Chung Ho

### **Staff**

Jui-Chu Lin

Wu-Shen Chen

Yu-Mei Chen

## **FACILITIES**

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### **Space and Facilities**

Bio-Industrial Mechatronics Engineering Department is located at the east side of the campus. Three main buildings of the Department, including Tomotake Hall, Main Department Hall and Building No. 2, occupy a total floor area of 6,270 square meters. The four-story Tomotake Hall contains welding and mechanic practice training factories on the first floor; classrooms, discussion rooms, and Chemisiry Lab on the second floor; and, Electronics & Electrical Engineering Lab, research laboratories, Prof. Tomotake Takasaka Memorial Chamber, and conference room on the third and forth floors. Main Department Hall is a three-story building. The first floor has laboratories, clean room and Information Center for Agricultural Mechanization & Automation. Professors' offices, information room, multimedia chambers, department office

and conference rooms are located on the second and third floors. Building No. 2 is utilized as BIME Student Association office, study rooms for Ph.D. students, research laboratories, and Education & Research Center for Bio-Industrial Automation.

The department is equipped with numerous facilities and equipment for teaching and research. The teaching aid facilities include various kinds of multimedia equipment, such as digital projectors for real objects, computer beamer projectors, slide projectors, overhead projectors, electronic blackboard, DVD, VCR and so on. The teaching apparatus and facilities include mechatronic, microprocessor control, hydraulic and pneumatic, automatic control, electronic and electrical, bio sensing, micro-nano systems and so on. As for the research equipment, the department has Shop-type Dynamometer, Viscosity Meter, Universal Testing Machine, Respiration Heat Meter, Frequency Analyzer, NIR Spectrophotometers, High Speed Video Recording System, High-density Magnifier, Gas Chromatography, Leaf Temperature Meter, Ultrasonic Instrument, Electrical Network Analyzer, Portable Laser Dust Monitor, NMR Analyzer, Cell Electroporator, Capillary Electrophoresis System, Global Positioning System (GPS), Multi-Spectral Remote Imaging System, Precision Controlled Temperature and Humidity Chamber, High Frequency Signal Generator, Spectral Imaging System, etc.

Computer instruction software includes fluid dynamic analysis, finite element analysis, computer-aided design and manufacture, hydraulic system design, numerical analysis, the image analysis, statistical analysis, Labview,

MATLAB, geography information system, and so on.

As to network, our department has an academic network connecting all our offices, classrooms, research laboratories, with hookups to academic institutions around the world, as well. In addition, we also built up our website for remote teaching and academic resource sharing.

## COURSES

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### Undergraduate Programs

The undergraduate curriculum provides the knowledge of mechatronics engineering and biological applications, and focuses on the accumulation of practice and experience as well. Our department's philosophy is to prepare students with engineering knowledge and application ability to face the challenge of new era.

Undergraduate students must take is 141 credits in total, including 30 credits of university requirements and 12 of electives. The remaining 99 credits, including 6 credits of BIME professional elective courses, are categorized into basic biology related courses, basic engineering courses, mechatronics engineering courses, professional courses and elective courses. The following is a breakdown of the required courses for each year:

**Freshman**

Calculus, General Physics & Lab, General Biology, Computer Programming Language, Engineering Drawing and Computer Graphics, General Chemistry & Lab, Introduction to Bio-industrial Mechatronics Engineering.

**Sophomore**

Engineering Mathematics, Thermodynamics, Applied Mechanics, Engineering Materials, Organic Chemistry & Lab, Mechanism, Hydraulics and Pneumatics, Machine Shop Practice, Strength of Materials, Introduction to Electrical Engineering & Lab.

**Junior**

Electronics & Lab, Fluid Mechanics, Automatic Control, Design of Machine Elements, Heat Transfer, Principles and Applications of Microprocessor, Measurement Principles and Applications, Bio-industrial Machinery, Bio-industrial Engineering Practice.

**Senior**

Mechatronics & Lab, Project for Undergraduate.

**Professional Electives**

Students must take two courses from among Introduction to Biological Chemistry, Power Machinery, Bioprocess Engineering, and Measurement of Biological Systems.

**GRADUATE PROGRAMS**

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The graduate program aims to cultivate students in independent thinking, analysis, creativity, and synthesis. The graduate program offers three specialization fields: “Machinery and System”, “Measurement and Control”, and “Materials and Process”. Each graduate student should select his/her major field. Each major field has its specific core curriculum and elective curriculum, coordinated with students’ personal research direction.

The core curriculum in each field covers the following:

1. Machinery and System : “Advanced Design of Machine” and “Systems Engineering”;
2. Measurement and Control : “Design of Automated Systems”, and “Signal Processing”;
3. Materials and Process : “Biomaterials” and “Unit Operations in Bio-Industry”.

In addition, each field has its own elective curriculum providing the required knowledge for thesis research.

Within two to four years, graduate students for Master degree must take at least 32 credits (excluding the credits on MS thesis), to fulfill the graduation requirement. These credits include 14 credits of required courses: Special Topics on Bio-Mechatronics, Seminar, and Special Graduate Topics; and at least 18 credits from elective

courses. Among the 18 credits of elective courses, students are required to take 9 credits from the major field of their graduate program, including at least 3 credits from the core curriculum. The graduate students with outstanding performance are eligible to apply directly to the doctoral program upon approval.

The Ph.D takes two to seven years of study. Ph.D. students must take a minimum of 36 credits (excluding the credits on doctoral dissertation). These credits include 14 credits of required courses: Special Topics on Biological Mechatronics, Seminar, and Special Graduate Topics; and at least 22 credits from elective courses. Among these 22 credits, students are required to take 15 credits from the major field curricula or core curriculum of their graduate program, including at least 6 credits from the core curriculum of the three major fields, and among these 6, at least 3 credits must be from the core curriculum of the student's major field.

## ACADEMIC ACTIVITIES

1. Holding seminars related to BIME topics.
2. Organizing domestic and international conferences.
3. Publishing symposium proceedings.
4. International academic visits and exchanges

## CAREERS AND FURTHER STUDIES

### ■ Professional abilities :

BIME integrates the engineering disciplines such as Mechanics, Electronics, Computer Science, Automatic Control, Chemical Engineering with applications to bio-industry, thus students can build up their professional skills such as Bio-industrial Mechatronics Engineering Design, Automation and Control, Bioprocess Engineering, Biomaterials, Waste Treatment, and Measurement in Biological Systems.

### ■ Further studies :

- (1). BIME graduate program
- (2). Graduate programs in Electrical Engineering, Mechanical Engineering, Information Engineering.
- (3). Graduate programs in Information Management, Business Management, Business Administration
- (4). Other related graduate programs, such as Environmental Engineering, Biomedical Engineering, Food Science and Technology, Material Science, Bio-engineering, etc.

### ■ Career options

Graduates are suitable for job positions as engineers, researchers, educators and more in the BIME-related fields including Bio-mechatronics Engineering, Mechanical Engineering, Electrical Engineering, Information Management, etc.

## CONTACT INFORMATION

---

Established in : 1981

Chair : Prof. Ta-Te Lin

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# 11. DEPARTMENT OF BIO-INDUSTRY COMMUNICATION AND DEVELOPMENT

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## INTRODUCTION

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The Department of Agricultural Extension was established by famous rural sociologist, Dr. Martin M. C. Yang in 1960. The department is renamed as Bio-Industry Communication and Development starting from August 2008 to cope with the dramatic social cultural change and industrial development.

Nowadays the marketing communication of bio-industry and social cultural development of human beings have become the prominent focus of teaching, research and extension in the area of bio-industry. This field is an integrated program covering food science, natural resources, bio-technology, health care, human ecology, leisure and green industry, ecological communication, etc. The advancement in this field can greatly improve the academic capability and competitiveness of students in this department.

The course design of the department has two foci, one is on bio-industry communication, and the other one is on social cultural development. On the area of bio-industry communication, internally it is to upgrade the knowledge and skills of people who work in the industry. Externally, it aims to increase

the understanding of the public toward bio-industry. On the area of social cultural development, the focus is to apply bio-industry information and knowledge to improve the quality of people's life.

We are confident that under the endeavor of all colleagues and students, this department has very bright future and should be able to develop highly competent graduates and workers to contribute to the area of bio-industry development.

## FACULTY

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Full-time: 13

Adjunct: 6

Ph.D. Degree: 17

M.S. Degree: 2

### Chair/ Assistant Professor

Erh-Rou Lai      Ph.D., Iowa State Univ.,  
USA

### Full-Time

#### Professor

Shu-Kwei Kao      M.S., NTU, ROC

Kun-Sun Shiao      Ph.D., Ohio State Univ.,  
USA

Yeu-Sheng Hsieh      Ph.D., Penn. State Univ.,  
USA

#### Associate Professor

Shu-Ken Sun      Ph.D., Paris 7th Univ.,  
France

Hsiu-Ping Yueh      Ph.D., Penn. State Univ.,  
USA

#### Assistant Professor

Jiun-Hao Wang      Ph.D., Kassel Univ., Ger-  
many

Ho-Chia Chueh      Ph.D., Univ. of Auckland,  
New Zealand

Yu-Hua Chen      Ph.D., Penn. State Univ.,  
USA

Shou-Cheng Lai      Ph.D., Lancaster Univ., UK

Li-Chun Huang      Ph.D., Kansas State Univ.

Yu-Chan Chiu      Ph.D., Johns Hopkins Univ.,  
USA

Li-Pei Peng      Ph.D., The Univ. of Tokyo,  
Japan

### Adjunct

#### Professor

Chao-Lang Chen      Ph.D., Ohio State Univ.,  
USA

Ping-Hung Chen      Ph.D., Penn. State Univ.,  
USA

Shin-Lai Lu      Ph.D., Iowa State Univ.,  
USA

#### Associate Professor

Yei-Fei Su      Ph.D., Univ. of Texas  
(Austin), USA

#### Assistant Professor

Yung-Chung Chiu      Ph.D., NTU, ROC

Yea-Meng Chuang      M.S., NTU, ROC



## FACILITIES

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The department is located on the fourth and fifth floors of Agricultural Hall. In order to cultivate the students' technical skills for producing interactive multimedia and using innovative learning technologies, many facilities, such as interactive sound and video production, nonlinear video editing and VOD systems, are installed in the department audio-visual laboratory. Two computer labs equipped with personal computers, laser printers and color scanners are open for students to work on their projects and study. Moreover, notebooks, projectors and internet access are available in all classrooms to facilitate teaching and learning.

## COURSES

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### Undergraduate Programs

The Department's undergraduate education program offers Bachelor of Social Science degree. Students must complete 128 credits, including 72 core courses, as follows:

### Graduate Programs

The Department's graduate education program offers M.S.S. (Master of Social Science) and Ph.D. (Doctor of Philosophy). The minimum requirements for the master and doctor degrees are 30 and 52, respectively.

## ACADEMIC ACTIVITIES

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1. Publishing academic journal the Review of Agricultural Extension Science, Taiwan Journal of Rural Studies annually.
2. Organizing conferences and symposium on bio-industry communication and social cultural development periodically.
3. Offer colloquia, workshops and lecture series to foster professional development and intellectual exchange among faculty and students.
4. Develop, manage and conduct externally funded research projects related to extension education and rural sociology.
5. Collaborating with agricultural agencies and farmers' associations on activities such as consulting, planning, and evaluation .



## CAREERS AND FURTHER STUDIES

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### 1.Career Options

Besides to be employed as government officers, the college graduates can also find their jobs in private sector to work in the fields of marketing, human resource development, program planning, media planning, strategic planning, and advertisement, etc.

### 2.Further Studies

The college graduates can advance their expertise in the following areas based on their interests:

1. Life-long education, adult education, instructional technology, cultural studies, industry communication, innovation and diffusion, non-profit organization, community marketing, green marketing, etc.
2. Sociology, environmental resources, leisure industry, green industry, industry operation and management, community development, community communication, etc.

## CONTACT INFORMATION

---

Established in: 1960

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# 12. DEPARTMENT OF ENTOMOLOGY

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## INTRODUCTION

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National Taiwan University (NTU), formerly called Taihoku Imperial University was founded in 1928 by the Japanese Government, but reestablished in 1945 when Taiwan was restored to the Nationalist Chinese Government. Three laboratories, namely, Plant Pathology, Entomology and Sericulture, then under the College of Science and Agriculture, were merged into the Department of Agricultural Biology and College of Agriculture, NTU. The Department was renamed the Department and Graduate Institute of Plant Pathology and Entomology, with two divisions—Division of Plant pathology and Division of Entomology. The Ph.D. program, which was among the first ones offered in the College of Agriculture, has been offered since 1967. The Department was recently divided into two separate departments. Thus, the independent Department of Entomology was established on August 1, 1998.

Our goals are to train students with comprehensive knowledge and state-of-the-art techniques in entomology, plant quarantine and integrated pest management in order to meet the needs of society. The students who graduate from the Department will have a wide range of careers in both the pri-

vate and the public sector related to teaching, research, extension and administration in plant protection and quarantine, ecological conservation, environmental pollution, disease vector control and biotechnology.

## FACULTY

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Full-time : 13

Part-time : 7

Ph.D. Degree : 20

### Chair/ Professor

Shih, Cheng-Jen      Ph.D., National Taiwan University, Taiwan

### Full-time

#### Professor

Yang, Ping-shih      Ph.D., National Taiwan University, Taiwan

Chang, Hwei-Yu      Ph.D., University of California, Davis, CA, USA

Wu, Wen-Jer      Ph.D., National Taiwan University, Taiwan

Lee, How-Jing      Ph.D., University of California, Davis, CA, USA

Ko, Chiun-Cheng      Ph.D., National Taiwan University, Taiwan

Rong-Nan Huang Ph.D., National Taiwan University, Taiwan

Chun-Che Chang Ph.D., University of Cambridge, UK

#### **Associate Professor**

Shiao, Shih-Feng Ph.D., National Taiwan University, Taiwan

En-Cheng Yang Ph.D., Australian National University, Australian

#### **Assistant Professor**

Ju-Chun Hsu Ph.D., National Taiwan University, Taiwan

Toshinori Okuyama Ph.D., University of Florida, USA

Chi-Wei Tsai Ph.D., University of Ohio, USA

#### **Adjunct Professor**

Chow, Yion-Shing Ph.D., University of Auburn, USA

Kao, Sjuuey-Sheng Ph.D., University of Minnesota, USA

Wang, Shun-Cheng Ph.D., National Taiwan University, Taiwan

Peng, Wu-Kang Ph.D., National Taiwan University, Taiwan

Hsu, Tung-Ching Ph.D., National Taiwan University, Taiwan

Chen, Chiou-Nan Ph.D., University of Illinois, Urbana, IL, USA

Wang, Chung-Hsiung Ph.D., National Taiwan University, Taiwan

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## **FACILITIES**

The Department of Entomology has laboratories of Physiology, Toxicology, Ecology, Insect Conservation, Ecological Modeling, Taxonomy, Insect Pathology, Biological Control, Behavior, Genetics, Biotechnology and Agricultural Entomology. Each laboratory is well equipped for research. Research topics emphasize not only pest control and management for plant protection, but also medical and urban pests, as well as researches in useful insects, microbiology, biodiversity and biotechnology.

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## **COURSES**

The department offers a four-year undergraduate program leading to the degree of Bachelor of Agricultural Science as well as graduate programs for the Master of Science and the Ph.D. degree. The undergraduate students must complete a minimum of 130 credits.

## Undergraduate Programs

### General required courses

Calculus (General Mathematics) (B)(I)(I I)(6) 、 General Chemistry (Lab.)(4) 、 Organic Chemistry (Lab.)(4) 、 General Botany (Lab.)(6) 、 Fundamental Entomology (Lab.)(3) 、 Insect Identification(Lab.)(3) 、 The Art of Insect Science(1) 、 Statistics(3) 、 Applied Entomology (Lab.)(3) 、 Biochemistry (B)(I)(I I)(2) 、 Insect Functional Morphology And Physiology (I)(I I)(Lab.)(6) 、 Genetics(3) 、 Ecology(3)

Junior student is encouraged to choose one of the three programs with special course requirement listed below:

#### A : Pest Management Program(16credits) :

1.Introduction to Agriculture (2) 、 2. Farm Crops (A)(3) / Principles of Horticulture (3) 、 3.Principles of Insect Pest Management (2) 、 4.Economic Entomology (Lab)(2,1) 、 5. Pesticides(3) 、 6.Plant Pathology (B)(3)

#### B : Biodiversity Program(16credits) :

1. Insect Taxonomy & Lab (4) 、 2. Evolution (3) 、 3. Research Methods In Ecology (3) 、 4. Introduction of Biodiversity (3) 、 5. Molecular Biology (3)

#### C : Biotechnology Program(16credits) :

1. 【 Biotechnology Core Techniques (4)】 、 2. Molecular Biology (3) 、 3. Microbiology (3) 、 4. Cell Biology (3) 、 5. Neurobiology (3)

## Graduate Programs

At the graduate level we offer a 2-4 year program leading to the degree of Master of Agricultural Sciences. The minimum requirement of credits is 24, plus 6 credits of thesis. The Ph.D. program requires 18 course credits, plus 12 credits of dissertation. It can be completed in 2 to 7 years. The student must pass both oral and written qualified examinations and defend the Ph.D. dissertation before the chosen committee.

## ACADEMIC ACTIVITIES

1. Participate in national/international conferences.
2. Organize national/international conferences related to Entomology.
3. Co-sponsor annual meetings of the Formosan Entomological Society and the Plant Protection Society of the Republic of China.

## CONTACT INFORMATION

Established in : 1998

Chair : Shih, Cheng-Jen

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E-mail : [shihcj@ntu.edu.tw](mailto:shihcj@ntu.edu.tw)



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# 13. GRADUATE INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY

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## INTRODUCTION

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### History

This institute was established in 1976 as the only graduate institute that was independent of an undergraduate department in the College of Bioresources and Agriculture. The domestic food industry began to take off in the 70s. A great demand for graduates trained in food science and technology arose at that time. National Taiwan University filed in the application to establish this institute to the Ministry of Education and received approval based on the suggestion from Dr. Stephen S. Chang, a professor at the Food Science Department of Rutgers University and a consultant to the Ministry of Economic Affairs of the ROC, and his colleagues, with the support from the Ministry of Economic Affairs, the Council of Agriculture, and local food industries. It was the first food science graduate school in this country.

This institute started with an M.S. program. The first class graduated in June 1978. Later, to help in upgrading the technological level of domestic industry, with the support of an increased number of faculty members and quantity and quality of teaching and research facilities, the Ph.D. program was started in 1983. The first Ph.D. student graduated in 1987.

### Purpose

The major purpose of this institute is to train graduates capable of doing advanced research in food science and technology. Both the M.S. and Ph.D. programs are divided into "Food Science" and "Food Technology" units. The former emphasizes food chemistry and food microbiology, but also covers nutrition, food hygiene and safety, etc.; the latter emphasizes food processing and food engineering, but also covers food packaging, food machinery and related areas. Students who graduated from undergraduate programs in Food Science and Technology, Agricultural Chemistry, Nutritional Science, Agronomy, Horticulture, Animal Science, Veterinary Science, Forestry, Plant Pathology, Botany, Zoology, Chemistry, Applied Chemistry, Chemical Engineering, Mechanical Engineering, Pharmacy, Medical Technology, Nursing, etc. are all welcome to apply for admission to this institute.

To integrate relevant undergraduate departments in training graduates in food science and technology, this institute inaugurated the Interdepartmental Food Science and Technology Program in 2000 as an important step leading to an undergraduate Department of Food Science in the future.



## New Developments

"Health and Nutrition" was taken as an independent group in the application for admission of M.S. and Ph.D. programs in this Institute since 2002 and 2006, respectively. Education in health food is being strengthened. Besides existing specialized areas, many faculty members are involved in joint research programs in health foods. Several companies have awarded grants to this institute for cooperative research in this area.

A new annex named "NTU Food R/D Building" that houses the "Center for Research and Development of Foods with High Added-Value" was commissioned in 2004. This center is used to help farmers' associations to upgrade their technology in food processing, to verify the health function of foods, and to develop new products.

## FACULTY

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Full-time: 12

Part-time: 4

All with Ph.D. degree

### Director/ Professor

Roch-Chui Yu      Doctor of Philosophy in  
Food Science, Cornell  
University

### Full-Time

#### Professor

Cheng-Chun Chou      Doctor of Philosophy in  
Food Science, University of  
Wisconsin

Lucy Sun Hwang      Doctor of Philosophy in  
Food Science, Rutgers Uni-  
versity

Wenchang Chiang      Doctor of Agriculture, Uni-  
versity of Tokyo

James Swi-Bea Wu      Doctor of Philosophy in  
Food Science, Purdue Uni-  
versity

Been-Huang Chiang      Doctor of Philosophy in  
Food Science, University of  
Illinois

An-I Yeh      Doctor of Philosophy in  
Chemical Engineering,  
Montana State University

Shun-Yao Hsu Doctor of Philosophy in Agricultural Engineering, Purdue University

Lee-Yan Sheen Doctor of Philosophy in Food Science, National Chung-Hsing University  
(including scholarship from Taiwan government to Rutgers University for one year)

#### Associate Professor

Ting-Jang Lu Doctor of Philosophy in Food Science and Human Nutrition, Iowa State University

#### Assistant Professor

Yi-Chen Lo Doctor of philosophy in Reproductive and Development Sciences

Shu-Chen Hsieh Doctor of Philosophy in Biochemistry

#### Part-Time

#### Emeritus Professor

Wei-Hsien Chang Doctor of Philosophy in Biochemistry, Michigan State University

Chin-Fung Li Doctor of Philosophy in Food Science, University of Wisconsin

#### Professor

Bonnie Sun Pan Doctor of Philosophy in Food Science, Rutgers University

#### Assistant Professor

Kwan-Han Chen Doctor of Philosophy in Food Science, Cornell University

## FACILITIES

The graduate institute has a four-floor "Food Science and Technology Building" and an annex that houses a pilot plant and an R & D center. Besides common laboratory apparatus, the institute has many important instruments and equipments, including:

#### Food Analysis Instruments

High Performance Liquid Chromatograph System; LC-MS; Gas Chromatograph; Atomic Absorption Emission Spectrophotometer; UV-VIS Double-Beam Spectrophotometer; Fluorescence Spectrophotometer; Far-red Spectrofluorometer; TLC; Superspeed Refrigerated Centrifuges; Dietary Fiber Determination Apparatus; Color Difference Meter; Rheometer; Fermenter; Environmental Chamber; Electrolysis Unit; Vacuum Concentrator; Short Path Distillation Apparatus; Supercritical Fluid Extraction System; ICP Emission Spectrophotometer; Differential Scanning Calorimeter; Automated Capillary Rheometer; Capillary Electrophoresis; Controlled Stress Rheometer; Microwave Moisture & Solids Analyzer; Laser Particle Analyzer; Manometric Gas Permeability Tester.

## Food Processing Equipments

Twin-screw and Single-screw Extruders; Centrifugal Separator; Spray Dryer; Freeze Dryer; Double Drum Dryer; Contact Freezer; Plate Heat Exchanger; Solid-Liquid Extraction System; RO/UF Membrane Concentration Unit; Vacuum Concentrator; Filter Press; Auto-retort; Steam Kettle; Automatic Can Steamer; Vacuum Package Sealer.

## COURSES

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1. The M.S. students are required to complete a minimum of 24 credits of course work in addition to 6 credits of thesis. The courses offered are as follows: Required courses: Seminar(4), Research Training(I)(II)(2), Research Experimental Methods in Food Science & Technology(I)(II)(2)
2. The student holding a master degree are required to complete a minimum course work of 20 credits in the Ph.D. program plus 12 credits of thesis. Students without a master degree must complete a minimum course work of 30 credits plus 12 credits of thesis. The courses offered are as follows: Required courses: Seminar(4), Research Training(I)(II)(III)(IV)(4)

## ACADEMIC ACTIVITIES

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1. Academic activities such as lectures and symposia are held or given by domestic and foreign scholars or specialists frequently.
2. The graduate institute has a cooperative agreement with the Food Industry Research and Development Institute (located in Hsin-Chu City) to strengthen the cooperation in research and to share facilities.

## CONTACT INFORMATION

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Established in: 1976

Director: Roch-Chui Yu, professor

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E-mail: [fsatn@ntu.edu.tw](mailto:fsatn@ntu.edu.tw)

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# 14. GRADUATE INSTITUTE OF BIOTECHNOLOGY

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## INTRODUCTION

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This new institute has just been established on the 1st of August, 2006 and has taken in PhD students for the academic year 2006. The mission for our institute is to provide great research and teaching environment for the following fields that fits the direction of our national development: Bioinformatics, Nano-Biomedical research, Tissue engineering and Recombinant Medicine, Genomics and Proteomics. Our outstanding faculties have got extensive research experience abroad and have thus formed a strong international collaborative research team. In addition, since the establishment of this new institute, we have been involved in integrating inter-departmental and inter-College teaching and research resources in the fields related to Biotechnology. This power has been catalyzed further by introducing training in Law and Management. Our research and teaching resources has provided the best incubator for the PhD students to become tomorrow's leaders in both Biotechnology industry and research community.

## FACULTY

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Fulltime: 8

Part-time Faculties: 19

Faculties with PhD degrees: 100%

### Director/ Professor

Huu-Sheng Lur      Ph.D., Cornell University,  
USA

### Full-Time

#### Associate Professor

Hsuan-Shu Lee      Ph.D., NTU

#### Assistant Professor

Shau-Ping Lin      Ph.D., University of Cambridge, England, U.K.

Je-Ruei Liu      Ph.D., NTU

Mong-Hsun Tsai      Ph.D., National Yang-Ming University

Jen-Chih Chen      Ph.D., University of California at Davis, USA

Li-Ying Sung      Ph.D., University of Connecticut, Storrs, USA

Chi-Te Liu      Ph.D., University of Tokyo, Japan

Shih-Shun Lin      Ph.D., National Chung-Hsing University

**Part-Time****Professor**

Fong-Hue Lin	Ph.D., National Cheng-Kung University
Red-Man Chu	Ph.D., Iowa State University, USA
Ching-Ho Wang	Ph.D., Louvain University, Belgium
Shih-Torng Ding	Ph.D., Ohio State University, USA
Winston T.K. Cheng	Ph.D., University of Cambridge, England, U.K.
Chu-Fang Lo	Ph.D., University of Tokyo, Japan
Pung-Ling Huang	Ph.D., University of Cologne, Germany
Huu-Sheng Lur	Ph.D., Cornell University, USA
Chan-Pin Lin	Ph.D., Rutgers, the State University of New Jersey, USA
Shean-Shong Tzean	Ph.D., McGill University, Canada
Ruey-Fen Liou	Ph.D., Indiana University, USA
Rong-Huay Juang	Ph.D., NTU

Yen-Jen Oyang      Ph.D., Stanford University ,  
USA

**Associate Professor**

Kuo-Long Lou      Ph.D., University of Basel,  
Switzerland

**Assistant Professor**

Shinn-Chih Wu      Ph.D., NTU  
Shun-Fu Lin      Ph.D., Iowa State Univer-  
sity, USA  
Chun-Che Chang      Ph.D., University of  
Cambridge, England, U.K.  
Chwan-Yang Hong      Ph.D., NTU  
Chii-Shen Yang      Ph.D., University of Illinois  
at Chicago, USA

**FACILITIES**

Core facility room: Milli-Q water purifier, Ice maker, ELISA reader (UV/vis), Ultracentrifuge (Beckman L8-70, SORVALL RC5C+, TOMY MX-301), Fluorescent photographing system, Freeze Drier, Freezer (-80°C), Radio Imaging system, Scanning and Imaging analysis system, RT-PCR, 2-D gel electrophoresis, Cell culture facilities, Nanodrop ND-1000, UVP Bio Spectrum AC, Olympus CKX41, Nikon Eclipse 80i, Leica MZ16F.

## COURSE

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### Ph.D. progeam

#### Minimal Credits for Graduation: 20

1. Frontiers in Biotechnology I (1)
2. Frontiers in Biotechnology II (1)
3. Seminar (4)

Another including at least 2 of the 7subjects  
listed below:

1. Epigenetics (3)
2. Stem Cell Biology (3)
3. Structure Biology & Bioinformatics (3)
4. Immunological Techniques: Antibody tools (3)
5. Transgenic and Cloning Technology in Animal (3)
6. Special Topics in Biotechnology (3)
7. Special Topics in Microbiology (3)

## CONTACT INFOMATION

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Established: 2006

Director: Professor Hsu-Sheng Lur

Website: <http://www.IOB.ntu.tw>

Email: [ntubiotec@ntu.edu.tw](mailto:ntubiotec@ntu.edu.tw)





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# 15. AGRICULTURAL EXHIBITION HALL

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## PREFACE

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Since the retrocession of Taiwan to the Republic of China, the successful implementation of the land reform program has solved fundamental problems of agriculture and improved farmers' living. The late Vice President Chen Cheng of the Republic of China, and Dr. Chiang Mon-Lin, the late Chairman of the Sino-American Joint Commission on Rural Reconstruction (JCRR) recognized agricultural development in Taiwan as an excellent model for developing countries. Therefore, the Agricultural Exhibition Hall was built on the main campus of National Taiwan University in 1964 to demonstrate this success.

In the beginning, the Agricultural Exhibition Hall displayed the implementation and achievement of the land reform program and introduced the progress of agricultural and rural development in Taiwan. Since then, the exhibition content has been renewed and changed many times in response to the progress of agricultural and rural developments.

## GOALS

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Agriculture is the industry most intimately associated with people's lives. It is an economic industry providing food, an ecological industry sustaining the environment and a living industry possessing rich cultural connotations. The main purpose of this Hall is to bring up-to-date information on agricultural development to students, trainees, as well as visitors from domestic and foreign countries. The Agricultural Exhibition Hall is also an important site for them to understand the general picture of rural development in Taiwan.

Recently, due to rapid social and economic changes, the concepts of "Biodiversity" and environmental education have become more and more important, so has the impact of natural environment maintenance on regional development and life quality improvement. Therefore, Agricultural Exhibition Hall had redefined its exhibition policy and contents in 2003 to activate its diverse social and educational function.

## ORGANIZATION

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The Agriculture Exhibition Hall is organized as follows: one director and two sections. The director manages and directs the operation of the hall. The technical section is in charge of the following: survey and analysis of the bio-resources and agricultural information, publishing, planning and designing of exhibition contents, as well as holding exhibition activities. The administration section is in charge of general affairs for documentation, property management, accounting, procurement, exhibition place maintenance, and the logistics support for exhibition activities.

## CURRENT ACTIVITIES

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Facing the impact of international and domestic socioeconomic changes, Taiwan's agricultural sector has been expected to improve the living condition and to protect the human environment in addition to increasing farmers' income. Environmental protection and ecological education have become more and more important nowadays in every country. Since the NTU campus is full of various green resources, and has become an excellent niche for ecological education, the

Agricultural Exhibition Hall was remodeled to present the abundance of these bio-resources for better environmental education. The first floor is an area for displaying special topics, the second floor is for the exhibition of "A View of Bio-diversity from NTU Campus", while the third floor is designed as a conference room and the education center for bio-resources with agricultural audio-visual publications. With lively guides and impressive exhibition and conference activities, we hope the audiences can understand the importance of environment maintenance, as well as the ability and sentiment to guard and to protect the earth on which we live.

## PLANS

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As the leading university in Taiwan, NTU is expected to play the leading role in educational ideology and concurrent social issues. In the future, The Agricultural Exhibition Hall will keep on designing environment-related exhibitions and conducting various educational activities, including lectures, workshops, conferences, and publications. These efforts are being made to sustain our beautiful living space forever for future generations.

## CONTACT INFORMATION

---

Established in: 1964

Director: Prof. Zueng-Sang Chen

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Website: <http://www.aeh.ntu.edu.tw>

E-mail: [ntuaeh@ntu.edu.tw](mailto:ntuaeh@ntu.edu.tw)



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# 16. EDUCATION AND RESEARCH CENTER FOR BIO-INDUSTRIAL AUTOMATION

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## GOALS

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The mission of Education & Research Center for Bio-Industrial Automation (ERCBA) is to cultivate qualified manufacturing, R/D and management professionals for bio-industrial automation to upgrade the bio-industry in Taiwan.

## BACKGROUNDS AND HISTORY

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To solve the labor shortage and to increase productivity in Taiwan agriculture, the central government launched a ten-year project, named the "Agricultural Automation Project" in 1990. In accordance with the policy, the ROC Council of Agriculture sponsored a ten-year research and extension project. Besides that, the Ministry of Education provided a special fund for promoting training and education in automated agriculture.

The College of Bio-Resources and Agriculture at National Taiwan University took this opportunity to establish the Education Center for Agricultural Automation (ECAA) in 1992. ECAA was upgraded into the Education and Research Center for Agricultural Automation (ERCAA) in 1997 to conduct advanced research in automated agricul-

ture. Finally, to accommodate the rapidly developing bio-industry, the center was renamed the Education and Research Center for Bio-Industrial Automation (ERCBA) in 2005.

## ORGANIZATION

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The Center brings together faculty members from the College of Bio-Resources and Agriculture, and coordinates an interdisciplinary program in the study of automated bio-industry. The Center is governed by an advisory committee. The Dean of Bio-Resources and Agriculture serves as the chairman of the committee, and each department elects one member (the elected member should be a full-time faculty member of the College). Currently, there are 13 committee members. The Director of the Center is appointed by the Dean of the College from among the members of the committee. The section chief of Teaching and Research is also appointed and responsible for the internal management of research and teaching related affairs.

## CURRICULA PROGRAM FOR BIO-INDUSTRIAL AUTOMATION

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The Center coordinates a curricula program on bio-industrial automation. The curricula program consists of two parts: the program of Mechatronics, and the program of Computational Biology. Both programs offer introductory, fundamental, and professional courses. The former focuses on automation techniques applied in bio-industrial sectors, which equip students with the usage, design and research abilities of bio-industrial automated systems. The program of computational biology provides students with essential knowledge about using computational methods in the emerging bio-industries.

## FACILITIES

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The Center is located on the second floor of the Biomechatronics Building II. The Center offers students and faculty in the College licensed software, mechatronics and hydraulic/pneumatic equipment, as well as a network for their teaching and research projects. The Center network is connected to all departments in the College to assist in training future professionals in automated bio-industrial production and management.

The facility includes a mechatronic classroom and two computer rooms. The mechatronic classroom is equipped with the facilities of mechatronic equipment, such as: automation design/simulation systems, high speed data transfer interfaces, sensor modules, system testers, machine vision systems, hydraulic/pneumatic systems, and various controllers, etc. for education and internship purposes. The computer rooms have 50 PCs, with network connected to the Internet, which is accessible for multimedia instruction, internship and seminars. Other facilities include video projectors, slide projectors, VCR, TV sets, and projective screens, etc.

With facilities and classrooms for information and mechatronics, the Education and Research Center

for Bio-industrial Automation has the responsibilities of promoting and coordinating the research projects and education of automated bio-industry professionals.

## ACTIVITIES

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The ERCBA provides essential educational facilities and environment for agricultural and bio-industrial automation. More than 25 routine courses, seminars and training classes are held every year. In summary, the usage rate is remained over 80% constantly.

Currently, on-going projects include the Education Upgrading Program for Automated Agriculture (sponsored by MOE), Automated teaching facility training program (sponsored by MOE), and agricultural automation projects (sponsored by COA). Further liaison, promotion service will be engaged in the future. Detailed information regarding the educational and research resources can be accessed in our website at <http://www.ecaa.ntu.edu.tw>.

Since the Center now functions with only one full-time staff specialist, it is limited in capacity and space. Research projects are mainly carried out in individual departments. Capacity and space will be expanded once the Agriculture Science Building, or the Bio-Industrial Mechatronics Building, is built.

## CONTACT INFORMATION

---

Established in: 1992

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Website: <http://www.ecaa.ntu.edu.tw>

E-mail: [ecaa@ntu.edu.tw](mailto:ecaa@ntu.edu.tw)





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# 17. EXPERIMENTAL FARM

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## INTRODUCTION

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The Experimental Farm of the University was established in the fall of 1957 as an independent affiliated organization by the combination of eight divisions, i.e. Administration, Agronomy, Horticulture, Animal Husbandry, Forestry, Plant Pathology and Entomology, Agricultural Chemistry, Agricultural Engineering, and an Accounting office. Under the supervision of the Dean of College of Bio-resources and Agriculture, and associate manager of the farm, the Experimental Farm conducts research, extension and instruction programs for agriculture related development activities. Most of the practice courses of students and research experiments of faculty are carried on here.

The Experimental Farm has two separate locations. One location with 9.04 hectares of land is situated southeast of the campus, on section IV, Keelung Road. Another location, with 19.15 hectares of land lies at Ankeng near Taipei.

The Experimental Farm has a botanical garden for crops or varieties planted in the garden. These crops include agronomy, horticulture crops and medical herbs etc. It provides the material of students practice and observation.

The farm has a large collection of horticultural crops of tropical and subtropical origin, as well. These crops are propagated each year for teaching and research purposes. The division of Animal Husbandry of the Agricultural Experimental Farm raises dairy cattle, pigs, chickens and goats for laboratory and research uses. Raising dairy cattle

is one of the major tasks of the division. Recently, embryo transfer and artificial insemination techniques have been used to improve the productivity of the dairy herd.

Rice, vegetables, flowers, juice, bread, ice cream and fresh milk are produced on the Farm and sold to faculty and students.

In order to develop the ecological education, we built the ecological pond alongside Chou-Shan Rd., and restructured the botanical garden. Furthermore, we hold training classes to train ecology guides. At the same time, we established nature ecological education park in Ankeng. We constructed a hillside ditch by ecological methods, dug an ecological pond, and set up an aquatic plant garden, which is also useful for flood control. We transformed the original dairy barn into an educational training center, as well.

## CONTACT INFORMATION

---

Established in: 1924

Manager: Bao-Ji Chen

Tel: +886-2-33669252

Fax: +886-2-23630559

Website: <http://bioagri.ecaa.ntu.edu.tw/farm/>

E-mail: [fpys@ntu.edu.tw](mailto:fpys@ntu.edu.tw)



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# 18. EXPERIMENTAL FOREST

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## INTRODUCTION :

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The Experimental Forest, College of Bio-Resources and Agriculture, National Taiwan University (hereafter referred to as the Experimental Forest) was originally established in 1901 during the period of Japanese occupation as the “Taiwan Practice Forest” attached to the college of Agriculture of Tokyo Imperial University. After the restoration of Taiwan to Chinese rule in 1945, the forest area was placed under jurisdiction of the Forestry Bureau of the Provincial Government of Taiwan and renamed “The First Demonstration Forest Area”. The Jia-yi and Taichung Forest District shared administrative duties. In the autumn of 1949, the forest was entrusted to the National Taiwan University, which reestablished it as “the Experimental Forest”. In July 1950, it was given its present name. In 2002, with the renaming of College of Agriculture, the full name of the Experimental Forest was changed to “The Experimental Forest, College of Bio-Resources and Agriculture, National Taiwan University.”

The Experimental Forest has four major objectives: 1) academic research, 2) teaching and field practice, 3) Resources conservation, and 4) demonstration in forest management. The Experimental Forest lies in central Taiwan and administratively belongs to Lugu, Shueili and Sin-yi townships in Nantou County. The terrain rises from 220 meter above sea level at the southern bank of Jhuoshuei River to 3,952 meter above sea level at the peak of Yushan, covering 32,781ha and occupying about 1% of Taiwan Island. The jurisdiction area of the Experimental Forest covers an elevational gradient of 3,732 m. With this wide variation in elevation from sea level, the Experimental Forest represents the five climatic zones of Taiwan: Sub-Tropical, Warm-Temperate, Cool-Temperate, Cold-Temperate and Frigid zones. Each climatic zone has special forest types that make this forest area worthy of being called the best site in Southeast Asia for conducting forest research, teaching and field practice. Not only is it abundant in plant species but also in wildlife resources. And it is a veritable treasure house for academic research applications from various university departments and graduate institutes in biology sciences. Furthermore, it also provides us with a place for ecological education.



## OBJECTIVES :

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### 1. Research:

In addition to basic scientific research, studies at the Experimental Forest focus on finding solutions to forest management problems and helping local businesses and communities develop and prosper.

### 2. Education:

The Experimental Forest has bountiful natural resources and a variety of facilities, providing an ideal setting for field training courses for students whose majors are related to Forestry. Graduate students can find study topics and conduct research in the Experimental Forest. We encourage schools to join with the Experimental Forest to teach and train their students.

### 3. Forest Management Demonstration:

- (a) Land use management: Plantations, contract forests and forest lands managed for other uses are monitored and surveyed regularly. Survey results are transferred directly to the forest Geographic Information System master database. This allows us to computerize and digitize forest management and preserve the integrity of the Experimental Forest.
- (b) Forest ecosystem management: Forest resources are managed for multiple uses using ecological concepts. Long-term monitoring and repeated surveys provide the basic information used to evalu-

ate management practices and support policy-making. Enforcement of bans on illegal logging and farming help achieve the goal of sustainable harvest.

- (c) Management of multiple-use forests: Natural forests are left in their original state and protected against anthropogenic disturbances. In man-made forests, forest structure is changed, rotation periods have been lengthened and superior, native tree species have been selected to create multi-layered, mixed species plantations that enhance wood quality and quantity.
- (d) Contract forests: Forestation, done in accordance with the “Guidelines for planting forests”, has been encouraged and rewarded on contract lands. The Sha-li-xian Nature Education Center and the Phoenix Nature Education Garden serve as ecological education classrooms. To safeguard the land and protect people from harm, great efforts are made to conserve soil and water and to conserve resources in the Experimental Forest.

### 4. Environmental Conservation:

Current forestry policies emphasize ecological conservation. There are many unique habitats, and rare plant and animal species in the Experimental Forest. To enhance nature conservation, many ecological and wildlife reserves have been planned.

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# 19. HIGHLAND EXPERIMENTAL FARM

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## OBJECTIVES :

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With its tremendous climatic, environmental, biological, and ecological diversities, and its unique location in subtropical highland, the National Taiwan University's Highland Experiment Farm (NTUHEF) welcomes students, faculties, and researchers from National Taiwan University and other institutes with experiment plots, facilities, and accommodation for teaching, practical training, and research on highland farming and ecosystem issues. The Experiment Farm has also been operated and expected to be an example of sustainable highland farming in subtropical regions.

## HISTORY :

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NTUHEF is located on Ren-Ai in Nantou County at Central Taiwan. The farm was initiated and named Wu-Shen Highland Farm in 1937 but no future development plan was considered until a detailed investigation during 1952 and 1956 and a 5-year renovation completed in September 1961. The farm became part of the NTU's Experiment Forest in 1966 but later reclaimed its independent status as the Highland Farm of the College of Agriculture of NTU in

1973 to support the need of teaching and practical training for students in the Department of Horticulture and to promote highland farming in Taiwan. Professor Kang, Yeou-Der from the Department of Horticulture was named the first Director of the Experiment Farm. With Professor Kang's efforts the farm has grown and extended to meet the current need for teaching and research. In 2002, the Farm was settled with its current name.

## DESCRIPTION :

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### (1) TOPOGRAPHY AND TERRAIN:

NTUHEF situates in Central Taiwan's mountain ranges between 900 m and 2,700 m alt. With a total acreage of 1,092 ha, the experiment farm is constituted of three separate territories: the Truwan Sanctuary, the Chun-Yang Farm, and the Mei-Feng headquarter.

- Truwan Sanctuary is located in Truwan on the southern bank of Thuoshuei River and adjacent to Wan-Da Reservoir. The sanctuary covers a 397.6 ha, south facing, 10 to 25-degree slope hill site elevating from 900m alt. to 1,800 m alt. The entire sanctuary is occupied by primary forests.

- Chun-Yang Farm is situated on the northern bank of Thuoshuei River near Chun-Yang Village. The farm covers a 45.1 ha, 5 to 10-degree slope farmland elevating from 1,260m alt. to 1,600m alt.
- Mei-Feng headquarter is located between Mei-Feng and Yuan-Feng. The headquarter covers a 623.4 ha, 15 to 30-degree slope farmland and forest mix elevating from 1,700m alt. to 2,700m alt.

## (2) CLIMATE:

Due to the variance in elevation, climate differs greatly within the Farm. The climate pattern of Truwan sanctuary, the lowest among the three territories, is typical subtropical while Yuan-Feng, the highest point of the farm expresses a temperate climate. In Mei-Feng headquarter, annual temperature averages at 13.7 °C, with 25.3 °C maximum and 12.5 °C minimum in July, and 13.0 °C maximum and 2.5 °C minimum in January. Annual precipitation is close to 3,200 mm, with nearly 100 raining days.

## (3) INFRASTRUCTURE

Most flat and slow-slope lands in Chung-Yang Farm and Mei-Feng headquarter are cultivated. Both sites can be conveniently reached by Route Tai-14 and Route Tai-14A. Chun-Yang farm is bor-

dered by Route Tai-14 and Mei-Feng headquarter is penetrated by Route Tai-14A.

The northeast border of Mei-Feng headquarter is 16 km or 40 minutes on drive away from Hohuan Mountain and another 10 km from Da-Yu Ling where Route Tai-14A meets Route Tai-8. The southwest border, adjacent to Cing-Jing Farm, is 17 km or 30 minutes on drive from Wu-She where Route Tai-14A meets Route Tai-14. Chun-Yang Farm is 4 km northeast away from Wu-She and 5 km away from Lu-Shan Springs from the other direction.

## (4) CURRENT STATUS AND FACILITY

- **Truwan Sanctuary** is located in Truwan on the southern bank of Thuoshuei River and adjacent to Wan-Da Reservoir. The entire area is covered with natural vegetations. Apart from the walking path of Taiwan Electric Company, no human-made structure within the region and transpassing is restricted.
- **Chun-Yang Farm** is located on Chun-Yang Village in Ren-Ai Township or at Mark 83.5K on Route Tai-14. Elevation of the farm ranges from 1,260m to 1600 m alt. Annual temperature averages at 18 °C. The total acreage of 44 ha land includes a 30 ha mix of secondary for-



est and two-leaf pines plantations. The rest of the farm is cultivated farmland and is currently producing nursery plants and plugs for cabbage, sweet pepper, celery, and lettuce production. Chun-Yang Farm also produces tomatoes, strawberry and herbaceous ornamental plants in greenhouses. A fern garden, an aquatic plants collection, and an orchid garden are also open for teaching and researching purposes. Abundant wildlife can be observed within the territories day and night. Chun-Yang Farm is the ultimate destination for experiencing various nature and modern farming activities.

- **Mei-Feng Headquarter** : The 623.4ha territory of the Mei-Feng Headquarter includes 100 ha of cultivated land, in which 60 ha land area used to produce cabbages had been restored to forests by replanting local primitive trees such as mixed Taiwan alders, Chinese cork oaks, green maples, Taiwan red maples, Taiwan loquats, *Taiwania*, and Taiwan red cypress. The farm also includes 400 ha of previously grassland in which 120 ha land area has grown into a secondary forest with Taiwan alders, Japanese evodia, Kawakami hornbeam, Chinese cork oaks. Another 150 ha of the grassland are located at 2500 m alt. with abundant red-hair azaleas that provide spectacular scenery. The rest of the territory is occupied by natural forests which spread into Yuan-Feng, Sin-Ren-Gang, San-Jiao-Feng, and Mei-Feng mountains. More than 80 woody plant species such as Mori oak, few-fruited pittosporum, Taiwan

loquat, Taiwan diplofatsia, long-leaf evergreen chinkapin, Kawakami tanoak, red nanmu, Formosan michelia, Nantou actinodaphne, Taiwan yew, Taiwan plumyew, Taiwan dendropanax, and other endangered plant species have been recorded in this regions.



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## 20. VETERINARY HOSPITAL

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### INTRODUCTION

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The National Taiwan University Veterinary Hospital (NTUVH) was first built in 1955 on Chou-San Road of NTU campus with the financial support from the Council of Agriculture. It provided veterinary medical service for the public and clinic training for senior veterinary and graduate students of NTU. In the early time, the NTUVH offered in-house veterinary service for pets, farm animals, poultry, and fishery. Ambulatory veterinary service was also available for farms and ranches. Owing to the growing demands on in-house service, increased student number, and newly equipped facilities, the original NTUVH building became over-crowded. With the financial support from the Ministry of Education, a new veterinary hospital was then built on Keelung Road right next to the NTU main campus. The new NTUVH was a six-story building with basement and officially began to provide services in November of 1995. At the same time, the organization of NTUVH was also readjusted to support its function on teaching and clinical service. The NTUVH, thereby, became a full-functioning veterinary hospital and also one of the most advanced veterinary hospitals in the south-east Asia. With further support from the Council of Agriculture, 3 more stories of lab ani-

mal facilities and teaching/research spaces were added during 2002-2004 which turned the NTUVH into the current 9-story building. The NTUVH now consists of 9 sections, including Administration, Small Animal Medicine, Small Animal Surgery, Wards, Large/Food Animal Clinical Service, Diagnostic Medicine, Imaging Service, Pathology Service, Pharmacy, and Quarantine. There are around 145 staffs within which more than 80 are veterinarians and clinicians, including 20 faculties (7 small animal, 5 large/food animal, 5 pathology, 2 clinical microbiology, and 1 clinical pathology); 10 senior veterinarians; 6 interns; 20 residents; 3 chief residents; and 20 more graduate students of clinic tract. Annually, 22,000-28,000 pet animals receive medical attention at the NTUVH. Senior veterinary and graduate students are supervised by teams of faculties and clinicians to ensure high-quality clinical training. The NTUVH also accepts domestic and international veterinary and pre-veterinary students from other schools to pursue their externship.



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# 21. COMMITTEE OF AGRICULTURAL EXTENSION

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## PREFACE

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The Committee of Agricultural Extension (CAE) is one of the affiliated organizations in College of Bio-Resources and Agriculture, National Taiwan University. Via the College's assistances in agricultural education, research and extension, the CAE is designated to maximize the college's resources for its responsibilities: promoting the economic growth in rural areas and modernizing agricultural education system. The CAE is in charge of agricultural extension affairs in Northern Taiwan, including Keelung City, Taipei City, Taipei County, Taoyuan County, Hsinchu County, and Miaoli County.

## GOALS

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CAE's mission is to assist the government in agricultural development by acting as an information exchange center for NTU with other agricultural communities in agricultural education, research and extension education. The CAE in NTU especially maintains a close long-term partnership with Taoyuan District Agricultural Research and Extension Station (TYDARES), COA, Executive Yuan and Miaoli District Agricultural Research and

Extension Station (MDARES), COA, Executive Yuan So that, in addition to assisting the communication for the state of the art in agriculture among NTU, TYDARES, and MDARES, we are able to practically outreach and efficiently provide local farmers the latest technology information and technical advice for agricultural production.

## ORGANIZATION

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The CAE consists of Committee Members including the Dean of the College of Bio-resources and Agriculture as Chairman, the head of the Department of Bio-Industry Communication and Development as Executive Secretary, and heads of all the Departments in the College as Committee members. In addition, four Agricultural Extension Professors are invited by the CAE to assist in general affairs. Two full-time CAE staff is currently in charge of planning and coordinating in agricultural extension and administrative works.

## CURRENT ACTIVITIES

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1. Holding meetings for agricultural production and marketing strategy consultation.
2. Providing advice to agricultural production and marketing training classes.
3. Publishing agricultural extension articles, journals and periodicals.
4. Holding education and training workshops for agricultural extension professionals.
5. Coordinating and arranging AE professors of NTU to lecture in workshops and symposiums held by agricultural institutions.
6. Instructing production techniques and marketing strategy for rural farmers on site.

## PLANS

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The Committee of Agricultural Extension (CAE) will continue to work closely with its partner institutions and organizations to better serve local agricultural community with technical support, and advise farming individuals to pursue great benefits of their livelihoods in a sustainable style. The perspectives of our mission focus on :

1. Continue on agricultural extension services, through the strengthening of education for quality farming manpower and the integration of NTU research groups and scholars into a wider workforce network,
2. Promote sustainable farming businesses, through the introducing of efficient management measures including pesticide residue safety and produce tracking system, knowledge-based value-added agriculture and organic produce marketing systems, to help develop a safe, healthy supply network for agricultural communities,
3. Value bio-diversity and adaptive measures to global changes, by providing farmers current development on sustainable agricultural technology, to cope with possible losses by natural disasters.

## CONTACT INFORMATION

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Established in : 1977

Director : Prof.Bao-Ji Chen

Tel : +886-2-23638479

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E-mail : [ntuca@ntu.edu.tw](mailto:ntuca@ntu.edu.tw)





嘉大管理學院



# VII. COLLEGE OF MANAGEMENT



## Academic Units

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- Business Administration
- Accounting
- Finance
- International Business
- Information Management

## The Present & Former Deans

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Paul S. C. Hsu	(1987.8-1993.7)	Yun Lin (Acting)	(2000.5-2000.7)
Yu-Tsung Lin	(1993.8-1996.7)	Chen-En Ko	(2000.8-2003.7)
Hong-Chang Chang	(1996.8-1999.7)	Chan-Jane Lin (Acting)	(2003.8-2004.2)
Neng-Pai Lin	(1999.8-2000.5)	Mao-Wei Hung	(2004.2-present)

## HISTORY

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The history of NTU College of Management consists of three stages, the Initial Stage, from 1919 to 1947; the Growth Stage, from 1948 to 1986, and the Expansion Stage, beginning from the establishment of the College of Management in 1987. Business education in Taiwan traces its roots back to 1919 when the Japanese colonial government established the Taiwan Imperial Government Commercial High School. After Taiwan's retrocession in 1946, the school was renamed the Provincial College of Law and Commerce. The school was finally merged into the College of Law at NTU in 1947, and the Department of Commerce was organized within the College of Law the following year. This was the Initial Stage in Taiwan's business education.

Following the founding of the Department of Commerce in 1948, many different fields of business and management were established. In 1959, the Department of Commerce was divided into three divisions: Industrial Management, Accounting and Management, and International Trade. In order to offer students an integrated education and to foster greater professional abilities, the Graduate Institute of Commerce was established in 1972. In 1985, the Department of Commerce was further divided into several independent departments: the Department of Business Administration, the Department of Accounting, the Department of Finance, the Department of International Trade (it

had changed its name to International Business), and the new Department of Information Management, which completed the expansion of the fields of commerce. This was the Growth Stage in Taiwan's commercial education.

In 1987, the Doctoral Program of the Graduate Institute of Commerce was formally established. At the same time, with the efforts of many chairs and professors, the College of Management was formally recognized as the seventh College of NTU, and also was the first new college of the university after Taiwan's retrocession.

The NTU Executive MBA (EMBA), which commenced in 1997, is the first Executive MBA in Taiwan designed for senior executives seeking up-to-date knowledge of business operation. For the past three years, approximately forty professors of NTU College of Management have been participating in the Harvard Business School case teaching preparation. In 2006, NTU College of Management and Harvard Business School together held a seminar on Program on Case Method and Participant-Centered Learning/Case Writing and Course Development (PCMPCL/CWCD). It has brought the Harvard Case Teaching Method to internationalize domestic management education and in recent years has shown impressive achievements in the Interschool Case Championship. Furthermore, three Harvard Case Classrooms located in the College of Management were donated by enterprises and EMBA alumnus.

NTU EMBA Program is ranked top 43rd worldwide by the Financial Times 2008, and is the first choice for EMBA programs in Taiwan.

## INTERNATIONALIZATION

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NTU English MBA Program was initiated in 2004 as a certificate program and was transformed into a degree program in 2006. This English-taught program was renamed the Global MBA Program in 2007. Entrepreneurship, Innovation, and Real-world Practices are three dimensions for courses emphasizes. The program is designed for an international perspective and involves international activities. In order to get in to the top rankings of international management schools, NTU Global MBA reaches out to the world in many aspects to enhance student global competitiveness. The program also collaborates with top international management schools to co-instruct courses and enhance more industry-academy cooperation, aiming to prepare students as future leaders in the global market. Since 2008, Global MBA program and the Wharton School of the University of Pennsylvania have been collaborating on the Global Consulting Practicum (GCP) cross-functional course, which is designed to bridge the international business and academic worlds. As of 2009, GMBA's student body represents 5 continents, 34 countries, which reflects an extraordinary diversity of backgrounds and experiences.

The Office of International Affairs was established by the College of Management in 2005 in pursuit of promoting intercultural understanding and further internationalizing the NTU College of Management community. The Office of International Affairs oversees the college-level exchange program, which facilitates the exchange of students and faculty, the development of joint programs, the execution of projects that stimulate teaching and learning, the pursuance of the AACSB accreditation, the implementation of partnership programs, and other initiatives for students, faculty, and staff at NTU College of Management.

In the past four years, the Office of International Affairs has been actively pursuing internationalization initiatives. Currently, the College has established formal partnerships with 63 of the world's leading business schools. The exchange of students is one of the primary collaboration between partner schools and the College. For the 2008 academic year, there were 93 NTU College of Management students recommended for the exchange program at partner schools, and the College expected 85 international exchange students in return. For the 2009 fall semester, 103 NTU College of Management students will be recommended for the exchange program at partner schools, and the College will be expecting 75 international exchange students in return. Because of the increasing number of international partner schools, we expect to gradually offer even more exchange student opportunities each year. Our goal

is to recommend 20% of our students to our partner schools during their enrollment at the College to provide them with a global perspective and elevate overall competitiveness.

## CHARACTERISTICS

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After its establishment, the development of the College of Management has been the most ambitious amongst the NTU colleges. By collaborating with society, fine-tuning management skills, and in pursuing academic research, the College expects its students to become perceptive, responsible, innovative, motivated, and ethical. The College is committed to becoming the leading and the most influential business school; thus, the College establishes programs cautiously and emphasizes its teaching, research, social responsibility, and academic exchanges. The College seeks to develop a first-class faculty of both excellent researchers and outstanding teachers. Its goal is to offer students a quality management education with a global perspective. The College is dedicated to maintaining its position as a forerunner in both theoretical study and the application of knowledge. It aims to integrate its resources, to expand cooperation with corporations, to strengthen collaboration with society, and to elevate overall competitiveness. By emphasizing these concepts, the College ensures that it will remain a leading position in management education.

## GOAL

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As the most prestigious business education provider in Taiwan, the College of Management is dedicated to maintaining its position as a leader in the creation, dissemination, and application of knowledge in the management and business fields. The vision of the College is to become one of the premier and most influential business schools in the Asia- Pacific region.

## CONTACT INFORMATION

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# 1. DEPARTMENT & GRADUATE INSTITUTE OF BUSINESS ADMINISTRATION

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## INTRODUCTION

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### History

In 1948, the Ministry of Education authorized NTU to establish the Department of Commerce under the College of Law. In 1959, the department was divided into three divisions: business administration, was one of them. In 1985, the Business Administration Division was upgraded to the department status, and the Department of Business Administration was officially established. In 1992, the Department of Business Administration was further divided into two divisions: the Business Administration Division and the Industrial Management Division (In 2007 renamed to be the Technology Management Division). It's been 50 years since the Business Administration Division was established, and the number of alumni has exceeded 3,250.

In 1972, the Graduate Institute of Business Administration was established, and we began the MBA program. We have around 1,685 alumni serving well-known companies in various sectors of business.

In 1987, the Graduate Institute of Business Administration introduced the Ph.D. program. Our Ph.D. program focuses on marketing management, operation management, organizational behavior and human resource management, strategy management, and technology management. To date, 161 Ph.D. students have been graduated from our doctoral program.

In 1998, we started the EMBA program. In 2002, the College of Management integrated all of the EMBA programs. The original EMBA program at our Graduate Institute of Business Administration became the EMBA Business Administration program under the College of Management.

### Characteristics

#### New generation business operation model

1. Knowledge competition model-Emphasis on knowledge management and "human resource management".
2. Time-based competition model-Emphasis on information technology and "operation management".
3. Innovation competition model-Emphasis on technology innovation, exchange and "technology management".
4. Integration of industries model-Emphasis on business



model innovation and "strategic management".

5. Service-oriented model-Emphasis on customer relations and "marketing management" .

## Objectives

1. Curriculum design and periodical evaluation.
2. Curriculum effectiveness evaluation and improvement.
3. Cooperation between academia and industry; parallel learning from businesses.
4. Implement e-learning, on-line discussion, and distance learning.
5. Develop curriculum uniqueness among each field (organizational behavior and human resource management, marketing management, operation management, technology management, and strategic management); design new courses.
6. Develop case studies.
7. Electronic assisted teaching.
8. Encourage crossing field of study.
9. Educate students with language skills, management abilities, and global visions.
10. Build business consulting centers to provide learning opportunities for faculties and students.
11. Build business information data centers for the use of education and research.
12. Strengthen knowledge exchange and professional network with top foreign universities.

## MISSION

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1. Raise the overall research quality.
2. Integrate teaching and research resources with the other departments; provide unique courses.
3. Improve trainings in technology and system integration skills.
4. Raise the overall competitiveness.
5. Enhance academic researches in management.

## Future Development & Emphasis

1. Expand collaboration of courses within NTU and among other universities.
2. Expand knowledge exchange with foreign countries.
3. Raise research and teaching qualities.
4. Raise the number of graduate students; train top business managers for the development of the country.
5. Strengthen collaboration with Academia Sinica; introduce the Ph.D. programs for international students.
6. Strengthen cooperation with companies; provide students with a better learning environment.



## FACULTY

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Full-time: 22

Part-time: 13

Ph.D. Degree: 30

M.S. Degree: 5

### Chair/ Professor

Shucheng Chi Ph.D., State University of  
New York at Buffalo

### Full-time

#### Professor

Chung-Chau Chang Ph.D., National Chengchi  
University

Chia-Shen Chen Ph.D., NTU

Chang-Sung Yu Ph.D., Carnegie-Mellon  
University

Tsung-Chyan Lai (1996-) Ph.D., Stanford  
University

Jong-Tsong Chiang Ph.D., MIT

Wun-Hwa Chen Ph.D., State University  
of New York at Buffalo

Andy Ruey-Shan Guo  
Ph.D., MIT

David Ming-Huang Chiang  
Ph.D., University of Iowa

Shan-Yu Chou Ph.D., University of  
Chicago

Houn-Gee Chen Ph.D., University of  
Wisconsin

Luo Lu Ph.D., University of Oxford

Chung-Jen Chen Ph.D., Rensselaer  
Polytechnic Institute

Wenyi Chu Ph.D., London Business School,  
University of London

#### Associate Professor

Sung-Pei Yu M.S., University of South  
Carolina

Chung-Hsing Huang Ph.D., University of Texas,  
Austin

Ai-Chia Chuang Ph.D., Minnesota University

Chun-Yao Huang Ph.D., London Business School,  
University of London

#### Assistant Professor

Nai-Hwa Lien Ph.D., Cornell Graduate  
School, University of Cornell

Yi-Wen Chien Ph.D., Purdue University

Jiun-Yu Yu D.Phil., University of  
Oxford, U.K.

Chia-Wei Kuo Ph.D., University of  
Michigan, U.S.A.

## COURSES

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### Undergraduate programs

#### Compulsory Courses for Business

##### Administration

Calculus(6), Business Management(3), Economics(6), Elementary Accounting(6), Statistics(6), Civil Law(3), Commercial Law(3), Information Management(3), Management Accounting(3), Organizational Behavior(3), Management Science Models(3), Marketing Management(3), Financial Management(3), Operations Management(3), Business Policy(3), Module courses(12)

## **Compulsory Courses for Technology Administration**

Calculus(8), Business Management(3), Economics(6), Elementary Accounting(6), Programming Design(3), Statistics(6), Operations Management(3), Management Science Model Database Management(3), Organizational Behavior(3), Management Accounting(3), Linear Algebra(3), Financial Management(3), Marketing Management(3), Information Management(3), Management of Science And Technology (3), Science and Technology Law(3), Strategy Management(3), Analysis of Industry & Competition(3), Innovation Management And Entrepreneurship / Project Management(3)

## **Graduate programs**

The Graduate Institute of Business Administration offers a two-year program leading to the degree of Master of Business Administration (MBA). Students must complete at least 24 required credits, 21 selective credits of graduate courses and 6 credits of thesis; the required courses are listed below:

### **MBA**

Quantitative Methods (3), Strategy Management (3), Financial Management (3), Marketing Management (3), Operation Management (3), Management Accounting (3), Organizational Behavior (3), Information Management (3)

## **Ph.D.**

There are five groups in Ph.D. Program  
The web site: <http://www.ba.ntu.edu.tw/phd/web> has detail courses.

## **ACADEMIC ACTIVITIES**

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Our department encourages all kinds of researches in academic areas, including publications from faculty and students and participation in international conferences.

Besides, in order to promote the exchange of research results and improve the Academic research in the field of management, several conferences and seminars have been held in our department in the past 10 years.

In 2006 & 2008, we invited alumni to attend the reunion activity and present their academic papers. In 2009, we held KMO'2009 Forth International KMO Conference and Conflict Management Forum & Research / Teaching Workshop.

Sun Yun-Hsuan Management Forum and the "Seminar on Contemporary Leadership" sponsored by HP, TSMC and China Steel Corp., was established in March 1998 at the NTU. From 2001, this forum was also sponsored by the Far Eastern Group, the Cathay Group and China Steel Corp. The goal of the Sun Yun-Hsuan Management Forum is to introduce world-class leaders, not only to the students of NTU, but also to the general pub-

lic. Top leaders from business, government, or other domains are invited to be the forum's distinguished speakers.

In order to promote learning for students, the Sun Yun-Hsuan Management Forum is integrated into an ongoing MBA-level course (3 credits) entitled "Seminar on Contemporary Leadership." The course is structured around key issues on leadership and is offered to both MBA and senior undergraduate students. The lectures by professors focus mainly on theories and concepts of leadership.

The Conference on Taiwanese Enterprises in Southeast Asia; in Vietnam & Thailand and in Mainland China was hosted on 2000, 2001, 2003. In 2003-2004, we hosted Marketing Professional Speech Series, and the Forum on Information Innovation Application to Financial Issues was held on 2004. In 2001, we had CSMOT Conference, we also had Drive National Defence Industries Seminar and Excellence in global management.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities & Further Studies

- (1) Entrepreneurial management
- (2) General Management
- (3) Technology Management
- (4) Operations Management
- (5) Strategy
- (6) Marketing
- (7) Organizational Behavior
- (8) Finance

### ■ Career options

- (1) Product/ Brand Marketing
- (2) Entrepreneurial Management
- (3) Consulting/ Strategy
- (4) Operations/ Production Management
- (5) Corporate Finance/ Mergers and Acquisition
- (7) General Management
- (8) Product Development
- (9) Research
- (10) Sales
- (11) Trade

## CONTACT INFORMATION

---

Established in: 1959

Chair: Steve Shu-cheng Chi

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## 2. DEPARTMENT OF ACCOUNTING

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### INTRODUCTION

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The accounting Department provides talented students with the knowledge necessary to successfully compete in tomorrow's business environment. The department upholds its tradition of excellence by recruiting highly respected and knowledgeable faculty, preparing students for professional licenses in accounting, and supporting theoretical and applied research projects relevant to accounting profession. In order to keep up with the quick pace of domestic and international economic development and to meet the need for high-level executives in the field of accounting, the accounting Department established the master program (MBA, with major in accounting) in 1990. Aspiring to raise the standards of research and education in accounting, the department also established a doctoral program in 1994.

The core curriculum of the accounting Department can be divided into four different concentrations: general accounting, auditing, taxation, and accounting information systems. In order to give students a broad knowledge of business fundamentals, the department also offers various elective courses that combine accounting and other business disciplines. Because accounting is by nature

an applied social science, the department puts a tremendous emphasis on the connection between theoretical study and practical application. Most core courses are designed to include case studies, and experts in the field are frequently invited to speak and interact with students at seminars and roundtable discussions organized by the department. Furthermore, many students volunteer for VITA (Voluntary Income tax assistants) , helping individuals and small businesses file income tax returns, and gaining valuable experience in tax preparation process. Students wishing to obtain international exposure can participate in the exchange program between the University of Illinois at Urban-Champaign(UIUC), and the Department of accounting at NTU. The program allows our students to simultaneously earn a Master of Science in accounting degree (MSA) from Illinois and an MBA degree with a concentration in accounting from NTU.

## FACULTY

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Full-time: 25

Part-time: 19

Ph.D. Degree: 31

M.S. Degree: 13

### Chair/ Professor

Suming Lin Ph.D., Arizona State University

### Full-time

#### Professor

Rong-Ruey Duh Ph.D., University of  
Minnesota

Chen-en Ko Ph.D., University of  
Minnesota

Jimmy, Yang-Tzong Tsay  
Ph.D., University of Maryland

Rebecca, Chung-Fern Wu  
Ph.D., UCLA

Chan-Jane lin Ph.D., University of  
Maryland

Taychang Wang Ph.D., University of  
Pennsylvania

Shu-Hsing Li Ph.D., New York University

Yann-Ching Tsai Ph.D., UCLA

Chi-Chun Liu Ph.D., New York University

Shui-Liang Tung Ph.D., University of  
Wisconsin, Madison

Shuen-Zen Liu Ph.D., University of  
Pittsburgh

Shu Yeh Ph.D., UCLA

#### Associate Professor

Kuo-Tay Chen Ph.D., University of Texas,  
Austin

Chiawen Liu Ph.D., NTU

Ken Yaotsung Chen Ph.D., Syracuse University

Pei-Cheng Liao Ph.D., University of  
Washington

#### Assistant Professor

Chuan-San Wang Ph.D., University of  
Manchester

Wen-Hsin Hsu Ph.D., Lancaster University

Chih-Yang Tseng Ph.D., University of  
Maryland

Yen-Jung lee Ph.D., Michigam State  
University

Chih-Hsien Liao Ph.D., Case Western  
Reserve University

Ta-Wei Wang Ph.D., Purdue University

### Adjunct

#### Professor

C.Y. Cyrus Chu Ph.D., Michigan University

Hsiou-Wei Lin Ph.D., Stanford University

### Part-Time

#### Professor

Hong-Chang Chang Ph.D., University of  
Pennsylvania

Soushan Wu Ph.D., University of Florida

Eric Liluan Chu Ph.D., new York University

Kevin, C.W. Chen Ph.D., University of Illinois  
Urbana-Champaign

Yu-Hui Su Ph.D., NTU

#### Associate Professor

Ruey-Hsia Wan M.A., Soochow University

Hwey-Jane Lin M.A., University of  
Pennsylvania

Min-Chih Chuo M.A., National Cheng-Chi University

Sheng-Ford Chang M.A., University of Iowa

**Assistant Professor**

Chi-Chang Yu Ph.D., Stanford University

**Lecturer**

Yen-Sung Li M.A., Soochow University

Tzong-Li Lee M.B.A., Drexel University

**Professional**

Albert Hsueh M.B.A., Bloomsburg University of Pennsylvania  
M.A., Soochow University

Gary, Kuo-Lieh Tseng M.B.A., Harvard University  
Kennedy School

James Wang M.B.A., National Chengchi University

Ching-Tsai Chen M.B.A., NTU  
M.B.A., National Chengchi University

Tsung-Ming Chung M.B.A., National Chengchi University

SC Huang M.B.A., National Chiao Tung University

Kwo-Juh Maa M.B.A., National Chengchi University

## FACILITIES

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### Library

The main library of NTU houses over 3,366,000 volumes of books and 34,000 articles of academic journals, which provide for a treasure of knowledge. In addition, the College presently maintains a Management library adjacent to the College of Management Building. It contains nearly 300 volumes of books in Chinese and 4,600 in English. It also has a collection of nearly 400 periodical journals, including 270 in English and 17 in Chinese.

### Computer Center

In addition to the main computing center of the University, and the College of Management the department operates a computer center catering to faculty and students housed in the center are the following:

file server (1), web server(1), DHCP server (1), PC (30), NB(10), Projector (5), laser printer (10), photostat (3), scanner (2), bluetooth mouse (2), digital camera (2), digital video (1).

## COURSES

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### Undergraduate Programs

The Department offers a four-year program leading to the degree of Bachelor of Business Administration. A student must complete a minimum of 139 credit hours, of which 102 are required.



### **Undergraduate Core Courses**

Principles of accounting (6), Intermediate Accounting (6), Advanced Accounting (6), Cost & Management Accounting (6), Auditing (6), Economics (6), Statistics (6), Accounting Information Systems (3), Business Management (3)

### **Undergraduate Courses**

Business law (3), Calculus (6), Financial Management (3), Outline of Civil Code B (3), Tax Regulation (6), Special topics on Intermediate Accounting (3)

### **Master Programs (MBA and EMBA)**

The Department of accounting offers a two-year program leading to the degree of Master of Business Administration in accounting. A minimum of 45 coursework plus a master thesis is required for this MBA program.

### **Graduate Required Courses**

Accounting Information Systems Seminar(3), Advanced Auditing(3), Advanced Financial Accounting theory (3), Advanced Management Accounting (3)

Among elective courses, our MBA program requires at least 9 credits in the accounting category, 3 credits in the methodology category, and 12 credits in management category.

### **Ph.D. Programs**

The Department of accounting offers the degree of Doctor of Philosophy. a minimum of 43 credits of coursework, which includes 15 credits in required

courses, 19 credits in imperative elective courses and 9 credits in general elective courses are required. In addition , a doctoral dissertation is also necessary for the fulfillment of the requirement of a Ph.D. degree.

### **1. Prerequisites**

The following courses are prerequisites and can be waived with the approval of the chairman:

Intermediate accounting , Cost accounting/ Management accounting, Advanced

### **2. Required Courses:**

Empirical Research in accounting (I) (3), Empirical Research in Accounting(II) (3), Analytical and Behavioral Research in Accounting (3), Thesis Writing (I) (3), Thesis Writing(II) (3)

### **3. Imperative elective Courses:**

Accounting Research Workshop(I) (1), Accounting Research Workshop(II) (1), Accounting Research Workshop(III) (1), Accounting Research Workshop(IV) (1), Research methodology courses have to be elected: Econometric theory (I) (3), Microeconomics(I) (3), Microeconomics (II) (3)

At least two of the following research methodology courses have to be elected: econometric theory (II) (3), econometric theory (III) (3), Multivariate analysis (3), experimental Design (3)

## ACADEMIC ACTIVITIES

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1. Workshops: the Department of accounting holds the departmental workshops once a week, each of which lasts two hours. The faculty and graduate students at the department are invited to present papers covering issues in accounting.
2. Accounting theory and Practice Conference: The annual accounting theory & Practice Conference has been organized and hosted by the Department of accounting since 1989. The conference has attracts participants from all over the world and has been recognized as one of the major academic activities in the region. In the past, joint conferences had been co-organized with American Accounting Association CSU-Fresno, IFAC and the University of Illinois.
3. The NTU Management Review :the Review is published twice a year by the College. Each Department of the College takes charge of the editorship in turn for each year.
4. In November 1997, the Department of accounting signed a Joint Master Program with the University of Illinois at Urbana-Champaign. Under this program, a NTU master student in accounting, after the fulfillment of requirements at both universities, is conferred both a MBA degree from NTU and a MSA degree from UIUC. Future undergraduate are recruited in NTU & UIUC MAS program in 2008. In the same year, a new agreement signed between

NTU & UTD ( University of Texas at Dallas ) provides MSAIM program for undergraduates.

5. In November 1998, the Departments of Accounting of NTU, Fudan University in Shanghai, and Peking University in Beijing, as well as the School of Accounting of the Chinese University of Hong Kong started a strategic alliance called "the Dragon League" with the aim of promoting academic exchange and cooperation among the four leading institutions. Each school is responsible for sponsoring the academic activity in turn annually. It is hosted by our department this 2002 academic year in Taipei. Students of our department gain extraordinary performance through these years.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

Accounting, auditing, Financial Management, General Management, Financial Planning and Analysis

### ■ Further studies

- (1) Graduate Institute of Accounting
- (2) Graduate Institute of Finance
- (3) Graduate Institute of Business Administration
- (4) Graduate Institute of Management
- (5) Graduate Institute of Law
- (6) Graduate Institute of Media

### ■ Career options

Most students graduating from department of accounting or with an MBA in accounting seek jobs in accounting firms. There are also students choose to work in accounting or finance departments in companies, which others take the national exams to work in governmental accounting, auditing, tax, and SEC departments. After staying in CPA firms for three to five years, some transfer to other companies according to their interests and opportunities. Actually, it is not difficult for those in the accounting profession to transfer to other fields related to business. However, vice versa, those majoring in other fields might struggle to surpass accounting professionals. Our mission is to provide solid accounting training along with overall management skills. With integrated accounting training, we are confident our students will become outstanding leaders in public or private institutions in future.

## CONTACT INFORMATION

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## 3. DEPARTMENT OF FINANCE

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### INTRODUCTION

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The history of Department of Finance at NTU dated back to the era of Department of Business under the College of Law. In 1963, there were four divisions within the Department of Business: Banking, Business Administration, International Trade and Accounting. Each of four divisions, subsequently, became an independent department in 1985. The Department of Finance was emerged from the division of banking in line with the trend and demand of domestic and international finance.

The Department of Finance was established for 24 years until now. With the rapid change and development of financial industries, financial service has become one of mainstream for economic development. In order to respond the huge demand of professional from Taiwan society, Graduate Institute of Finance was founded officially in 1990 and the Ph. D program began its first enrollment in 1993. Besides, the EMBA program was launched in 2001 which responded the need of high-level talented people from the financial industries. In addition, divisions of Financial Engineering and Insurance within the Graduate Institute of Finance were offered separately in 1998 and 2001. In 2001, our Ph. D program was divided into three divisions

(Finance, Financial Engineering and Insurance) and began to recruit students at that time.

In order to respond to the trend and challenge of the financial industries, our department intensively recruits the most excellent faculty members and expands the facilities. Moreover, our faculty trains and teaches the students what's happening outside the campus and attitude of service with proactive teaching. Our department emphasizes on the interaction between technology and finance, teaches our students about ethnics, and asks them to develop international view. All these actions aim to make them top managers in financial industry of the coming century. In addition, in order to deepen the interplay of theory and its application, our department works with the domestic and international companies to provide our students with internship opportunities in the summer and winter vacations and offer abundant scholarship for our students.

Owing to the collaborative efforts by our whole faculty, students and alumni, the department of Finance, the department of Medicine and the department of Electrical Engineering are the highest-ranking departments in Taiwan. In the future, our department will continue to cultivate more

excellent students and make more remarkable academic contribution. Based upon these achievements and efforts, our department wishes to become one of excellent departments in the world.

## FACULTY

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Full-time:26

Part-time:14

### Chair/Professor

Ming-Shen Chen Ph.D., Michigan State University

### Full-time

#### Professor

Hsiaw-Chan Yeh Ph.D., University of California, Riverside

Hsien-Chan Ho Ph.D., University of Texas at Austin

Yueh-Chu Yen National Taiwan University

Yun Lin Ph.D., University of Illinois, Urbana-Champaign

Tsun-Siou Lee Ph.D., University of California, Berkeley

Chau-Chen Yang Ph.D., University of Illinois, Urbana-Champaign

Shean-Bii Chiu Ph.D., University of Washington

Dar-Yeh Hwang Ph.D., Rutgers University

Shyan-Yuan Lee Ph.D., Columbia University

Yu-Ren Tzeng Ph.D., Temple University

Sheng-Syan Chen Ph.D., SUNY-Buffalo

San-Lin Chung Ph.D., Lancaster University, U.K.

Shing-Yang Hu Ph.D., University of Rochester

Yeh-Ning Chen Ph.D., University of California, Los Angeles

Chung-Hua Shen Ph.D., Washington University

Hsien-Hsing Liao Ph.D., Rutgers University

Chung-Ming Kuan Ph.D., University of California, San Diego

Hwai-Chung Ho Ph.D., Wayne State University

Yun-Dauh Lyuu Ph.D., Harvard University

#### Associate Professor

Chyi-Mei Chen Ph.D., Massachusetts institute of technology

Yong-Chern Su Ph.D., Syracuse University

Yau-Huei Wang Ph.D., Lancaster University

Keng-Yu Yo Ph.D., University of Warwick, UK.

Pai-Ta Shih Ph.D., University of Texas at Austin

#### Assistant Professor

Wen-I Chuang Ph.D., University of Houston

## FACILITIES

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Our department offers many resources for students and faculty-books, magazines, journals, and access to various databases, including ABI/INFORM, BPO, DIALOG, STICNET, SEC-online, EBDS, ASIA-PACIFIC, INTLEC, MARS, INFOTRAC-BUSINESS INDEX, COMPUTER SELECT, TEJ, Thomson Financial Datastream, CRSP(Center for Research in Security Prices CRSP US Stock Databases), COMPUSTAT, and The Asia Wall Street Journal.

In addition, our department also maintains a computer cluster equipped with applied software Microsoft Visual Basic 6.0, Microsoft Visual C++ 6.0, SPSS 10.0, SAS. All of three facilities are intended to provide a state-of-the-art technology environment for students' learning and growth.

## PROGRAMS

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### Undergraduate Programs

The department of Finance offers the four-year undergraduate program leading to the degree of Bachelor of Business Administration (BBA). Students must complete 141 units of credits, and can require the Bachelor Degree. The compulsory coursework comprises of 87units of core courses and 42 units electives.

The learning goal of undergraduate program is to cultivate professional for the financial market. Thus, combined with the need of the theory and its application, the teaching of our faculty will focus on the students' balanced development in their study. In course, our department will require students to learn the basic knowledge in economics, accounting, monetary and banking, and investment when they are in the first and second grade. Further, our department will require students to select professional courses such as financial management, financial statement analysis, insurance and management of financial institutions to enhance their professional capacity when they are in the third and fourth grade. These training will establish a solid base for students' future professional career and studying abroad.

### Graduate Institute of Finance

Graduate Institute of Finance provides two years full-time study. Students must complete a minimum of 42 credits, including 12 core units and 6 units of the thesis. Before graduation, the graduated students must pass the English test. They must gain the 79 points or above in TOEFL IBT Test) or 780 points or above in TOEIC test. Program Core courses are Investment Management (3 credits), Quantitative Analysis (credits 3), Financial Institutions and Markets (3 credits) and Financial Theory (3 credits).

There are three divisions composing Graduate Institute of Finance including the Division of Finance, Division of Financial Engineering, and Division of Insurance. The learning goal of each division is to foster the talented people with professional knowledge of financial management. In order to respond both the developments of theoretical framework and its applications, our graduate program will constantly offer the professional courses to our students. Further, our department aims to educate professionals who are good at theoretical knowledge and practice and encourages our students to employ their knowledge to improve the efficiency of financial operations and accelerate Taiwan economic growth.

### EMBA Program

Our EMBA program offers an authentically learning channel that equips senior executives with the knowledge and perspective they need to address business challenges on a global scale. Further, our faculty offers more professional courses and programs. Therefore, students will have more opportunities to acquire both fundamental and specialized skills. In addition, students in our EMBA program can work together with our professors and high-impact executives from a wide range of industries. They learn not only from their formal classes but also from the perspectives and experiences of other students. Our EMBA program is designed for experienced professionals from a diverse range of backgrounds. There are three semesters in one year and most courses are arranged at night and on the weekend. Students who complete all works will be offered Master degree in Business.

### Ph.D. Programs

The Ph. D programs of study and research focusing on finance leading to the degree of Doctor of Philosophy is available for qualified candidates.

Students must complete a minimum of 45 units to complete their coursework, of which 21 units are core courses, and 12 credits are for the dissertation of Ph.D.

Mandatory Courses: Microeconomic Theory (I)(3 credits), Econometrics (I) (II)(6 credits), Seminar on Capital Market Theory (I)(3 credits), Seminar



on Corporate Finance Theory (I)(3 credits), Seminar on Finance (I) (II) (III) (IV)(12 credits). In addition to finance courses, our program strongly recommend that students take courses in other management-related areas.

There are three divisions composing Ph. D program, including the Division of Finance, Division of Financial Engineering, and Division of Insurance. The learning goal of each division is to foster the talented people with professional knowledge of financial management. The emphasis of the program is followed: 1) to require students to choose basic courses such as economics, financial management and capital market. These courses will enhance students' professional ability and establish a solid base for their theoretical analysis. 2) to provide students with rigorous training in research and students will enhance their research ability and cultivate their communication abilities in foreign language. 3) the strength of the program is the close interaction it provides between the faculty and students. The faculty work intensively with students, offering their time, expertise, and experience to facilitate the students' understanding of financial markets and institutions and their research. As part of this process, Professors and students frequently collaborate in joint research and publication. The goal of our Ph. D program is to produce high-quality scholars and to prepare them for successful academic careers.

## ACADEMIC ACTIVITIES

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### 1. Exchange Program

We encourage students to participate in Exchange Program to broaden their global view. By exchanging with famous international universities, students could share academic activities with each other and experience different cultures. During the year 2008-2009, there will be 66 students who acquire the admission to participate the Exchange Program.

### 2. NTU International Conference on Finance

The First NTU International Conference on Finance was held in 1995 and continuously flourishes to five conferences at 1998, 2000, 2002, 2004, 2006, and 2008. The conference has become a powerful indicator for the financial field in Taiwan as well as an opportunity for the business world to exchange ideas with the academics. The past keynote speakers have always being very reputable, including: Professor William Sharpe, The winner of 1997 Nobel Prize winner for economic sciences. Professor Myron S. Scholes, The winner of 1997 Nobel Prize, the co-inventor of the famous Black-Scholes formula. Professor Richard Roll, the chairman of AFA and the author of APT model. Professor Edward Altman, who provides the Z-score model, is the pioneer for the credit risk. All information about the conference can be checked on <http://www.fin.ntu.edu.tw/conference> .

### 3. Seminar

Many Seminars will be held in every semester. We invite popular scholars and celebrities to make a speech every week. We also encourage Professors and students to publish their research papers in famous journals and join the international conferences all over the world.

### 4. Global MBA Program

To increase students' foreign languages, we hold the Global MBA Program. Students could choose five of the eight English courses which they are interested in. All the courses are taught in English. After they fill the requirement, they could be offered the diploma.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) Corporate Finance Field
- (2) Security Investment and Analysis Field
- (3) Financial Institutions and Markets Field
- (4) Financial Engineering Field
- (5) Real Estates
- (6) Economic and Mathematical Field

### ■ Further studies

Any ability in finance can be extended.

### ■ Career options

Security Analysis, Security Investment Advisor, Mutual Fund Manager, Pension Fund Manager, Financial Institution Employee, Insurance Company Employee, Corporate Financial Management, Certified Public Accountants, Ministry of Finance, R.O.C. (National Treasury Agency, Taxation Agency, Bureau of Monetary Affairs, Securities and Futures Commission), Central Bank of China, Council for Economic Planning and Development.

## CONTACT INFORMATION

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# 4. DEPARTMENT OF INTERNATIONAL BUSINESS

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## INTRODUCTION

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Having grown out of the Department of International trade of the College of Management, NTU, the Department of International Business was created in 1992 in response to the trend toward internationalization in business and related academic research.

Also in 1992, the graduate Institute was granted the right to award master degrees, with the right to award doctorates being granted in 1995.

Continuing a fine tradition established for many years, the department's teaching, and the recruiting of faculty, are concentrated in five main areas: International Economic & Policy Analysis, International Marketing Management, International Finance & Banking, Business

Strategies; and Management & organization of International Businesses.

The department aims to give students sound academic training, so they graduate with a broad international outlook and capable of multifaceted development as managers in international business. With the trend towards internationalization and liberalization, busi-

nesses in R.O.C. have gradually found themselves facing keen international competition. Also, there is an increasing demand for people with international management skills. The excellent teachers and comprehensive course structure offered provide a perfect environment for those interested in International Business management. Our graduates are, not only competent to assume important management responsibilities, but in a position to make meaningful contributions to improving the R.O.C.'s international competitiveness.

## FACULTY

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Full-time: 25

Part-time : 26

Ph.D.: 47

### Chair/ Professor

Li-Chung Jen          Ph.D., Ohio State University

### Full-time

#### Professor

Hsiou-Wei Lin          Ph.D., Stanford University

Chiu-Ling Lu          Ph.D., University of  
Connecticut

Cheng-Kun Kuo        Ph.D., University of Texas at  
Austin

Ching-Sung Wu        Ph.D., University of  
California at Los Angeles

Yi-long Jaw            Ph.D., Ohio State University

Mao-Wei Hung        Ph.D., northwestern  
University

Ming-Je tang          Ph.D., Massachusetts  
Institute of technology

Heng-Chiang Huang   Ph.D., University of  
Michigan

Cheng-Min Chuang    Ph.D., University of  
Washington

Shi-Kuan Chen        Ph.D., Yale University

Ji-Ren lee              Ph.D., University of Illinois,  
Urbana-Champaign

Homin Chen            Ph.D., NTU

#### Associate Professor

Yong-Chang Chen    Ph.D., in Marketing,  
University of Pennsylvania

Jyh-Dean Hwang      Ph.D., University of  
Wisconsin, at Madison

Hong-Jen Chiu        Ph.D., University of  
Washington, Seattle

Hsin-Chang Lu        Ph.D., University of  
Chicago

Ming-Huei Hsien      Ph.D., University of  
Warwick, U.K.

Hsueh-Liang Wu      Ph.D., University  
Birmingham, U.K.

Chun-Chung Chen    Ph.D., University of Texas at  
Dallas

Jiun-Sheng Lin        Ph.D., University of  
Maryland

#### Assistant Professor

Yao-Wen Hsu          Ph.D., Cambridge  
University, U.K.

Yung-Chin Lien        Ph.D., King's College  
London, U.K.

Jr-Yan Wang          Ph.D., NTU

#### Lecturer

Sophia Cheng         Master, Golden Gate  
University

### Part-time

#### Professor

Yu-Yuen Bian         Ph.D., NTU

Chieh-Chien Chao    Ph.D., NTU

Chih-Kang Wang      Ph.D., Texas a &  
MUniversity

Tzoo-Shuh Chiang    Ph.D., University of  
Minnesota

Chi-Ruey Hwang      Ph.D., Brown University

Shuenn-Jyi Sheu,     Ph.D., Brown University

Chen-lung Chin	Ph.D., National Cheng Chi University
Ching-ter Chang	Ph.D., National Chiao Tung University
Yang Li	Ph.D., Iowa State University

**Associate Professor**

Shao-liang Liu	J. D., University of Chicago
Shih-Ju Wang	Ph.D., NTU
Sheng-Yung Yang	Ph.D., Drexel University

**Assistant Professor**

Shang-e Tai	Ph.D., Yale University
Chih-Wei Lee	Ph.D., NTU
Huei-ling Chen	Ph.D., NTU
Li-Chen Lin	J.D., national Taipei University
Chien-Hung Chen	Ph.D., NTU
Jia-Han Guo	Ph.D., NTU
Ming-Jen Chang	Ph.D., NTU
Nan-Wei Han	Ph.D., NTU
Chi Chung	J.D., Harvard University
Lan-Chih Ho	Ph.D., University of Birm- ingham
Jung-Mao Yeh	Ph.D., Oklahoma State Un- iversity

**Lecturer**

Jui-tsan Hung	Master, NTU
Louis T. Kung	Master, St. John's University
Stanley Chu	Master, NTU EMBA

**FACILITIES**

Situated on the 8th floor of College of Management Building, the department includes a Department office, a Chairman's office, a Seminar Room, a Conference Room, and a Multifunctional Laboratory

In addition, the department is equipped with personal computers, laptops, scanners, printers, projectors, and digital cameras.

The department owns approximate 92,934 books and 2,409 professional journals, which are in either English or Chinese.

**COURSES****Undergraduate Programs**

Calculus (6), Accounting (6), Principle of Economics (with recitation), Statistics (6), Introduction to International Business (3), Management (3), Investments (3), Money & Banking (3), Financial Management (3), outline of Civil Code (3), Marketing Management (3), Introduction to Management Information Systems (3), Mathematics for Management (3), Multinational Business Management (3), International Marketing Management (3), Marketing Research (3), International Business Strategy (3), International Trade: theory & Policy (3), International Finance : theory & Policy(3), Economics Academy(3), Financial

Academy(3)

### Graduate Programs

Industrial economics (3), Financial Management (3), Marketing Management (3), Managerial Accounting (3), International Economics (3), Multinational Business Management (3), International Marketing Managements (3), International Financial Investments (3), International Business Strategy (3)

### Ph.D. Programs

International Business Management Division : Seminar in economics of organization, Theoretic foundations of Strategic Management, Econometric theory, Doctoral Seminar on Theories of Multinational enterprises, Industrial Economics, Doctoral Seminar on International Management, Research Methodology, Managing International alliance, Multivariate analysis, Quantitative Models in Marketing, Special Topics on International Business Strategic Management Division: Microeconomics theory, theoretic foundations of Strategic Management, econometric theory, Industrial economics, Seminar in economics of Organization, Doctoral Seminar on theories of Multinational enterprises, Multivariate analysis, Quantitative Models in Marketing, Special Topics on Strategy Research

Marketing Management Division: Doctoral Seminar on Theories of Multinational Enterprises, Microeconomics Theory, Psychology of Cogni-

tion, Econometric theory, Seminar on Marketing Management, Mathematical Statistic, Seminar in economics of Organization, applied time Series analysis, Industrial economics, Multivariate analysis, Quantitative Models in Marketing, Special Topics on Marketing

International Finance & Banking Division: Doctoral Seminar on Theories of Multinational Enterprises, Theory of Quantitative Economics, Microeconomic Theory, Seminar on International Financial Markets, Seminar on International Economics, Seminar of International Corporate Finance, Seminar on Financial Engineering, Financial Mathematics

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## ACADEMIC ACTIVITIES

- (1) Seminars: Held without a fixed schedule, attended by the faculty of the management college and other invited renowned scholars to present papers.
- (2) NTU Management Review: A yearly publication of the management college. The five departments of the college take turns to be the editor in chief.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) International Business Management
- (2) International finance
- (3) International trade
- (4) International financial Management
- (5) International Marketing Management
- (6) International economic & Policy analysis

### ■ Further studies

The department aims to give students a thorough professional training, so they will graduate with a broad international outlook and capable of multi-faceted development as managers in international business.

- (1) International Business Management
- (2) International economic
- (3) International Marketing
- (4) International financial Management
- (5) International finance: theory & Policy
- (6) International economic & Policy analysis
- (7) International Business Strategy

### 3. Career options

International financial market employee, marketing and planning personnel, investment banking specialist, financial management specialist/ executive, business executive/general manager, etc.

## CONTACT INFORMATION

---

Chair: Li-Chung Jen

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# 5. DEPARTMENT OF INFORMATION MANAGEMENT

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## INTRODUCTION

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The Department of Information Management at NTU was established in 1991. After a few years of rapid growth, the Department now has eight-teen full-time faculty members, four adjunct faculty members, 246 undergraduate and 159 graduate students.

Our department objectives are as follow : 1.To cultivate leaders in Information Management 2.To pursue excellence in teaching and research 3.Continually engage in societal developments.

The goal of the NTU IM Undergraduate Program is to educate the students to possess these characters and capabilities: 1.Solid foundations in Information Technology knowledge 2.Proficient skills in professional management 3.Broad vision in strategic thinking 4.Ethical integrity and caring for the society; The goal of the NTU IM Graduate Programs in to educate the students to become: 1.IT practitioners who can manage 2.Professional managers who understand technology 3.Independent researchers with a critical mind 4.Team leaders with ethical integrity.

We conclude student's core competencies of IM according to different programs : Undergraduate program—1.Professional expertise 2.Logical reasoning and problem solving 3.Critical and independent thinking 4.Proctical applications 5.Communication skills 6.Teamwork and leadership 7.Interdisciplinary knowledge and caring for the society; MBA program—1.Professional expertise 2.Exploratory and independent research 3.Logical reasoning and problem solving 4.Practical applications 5.Communication skills 6.Teamwork and leadership; PHD program—1.Professional expertise 2.Exploratory and independent research 3.Logical reasoning and problem solving 4.Practical applications.

Featuring highly professional yet comparatively junior faculty members, genuinely free atmosphere, and substantial interaction with other department in the College of Management, the Department can safely be named as one of the best academic units to train specialists in information management science. In recent years, moreover, the Department has made persistent attempts to expand its overall scale, and recruit best possible new faculty members.

## FACULTY

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Full time: 18

Adjunct: 4

Ph.D.: 22

### Chairperson/Professor

Ching-Chin Chern Ph.D., University of Texas at Dallas

### Professor

Seng-Cho Chou Ph.D., University of Illinois at Urbana-Champaign

Yuh-Jzer Joung Ph.D., University of New York at Stony Brook

Yeali Sun Ph.D., UCLA

Ming-Hui Huang Ph.D., University of Wisconsin-Madison

Chorng-Shyong Ong Ph.D., National Taiwan University

Juei-Tine Lee Ph.D., University of Illinois at Urbana-Champaign

Houn-Gee Chen Ph.D., University of Wisconsin - Madison

### Associate Professor

Ching-Chia Hsieh Ph.D., National Chiao-Tung University

Yih-Kuen Tsay Ph.D., UCLA

Yeong-Sung Lin Ph.D., USC

Robin Bing-Yu Chen Ph.D., University of Tokyo

Ling-Ling Wu Ph.D., University of Chicago

Carol Hsu Ph.D., London School of Economics and Political Science

Bow-Yaw Wang Ph.D., University of Pennsylvania

Tyng-Ruey Chuang Ph.D., State University of New York

### Assistant Professor

Chien Chin Chen Ph.D., National Taiwan University

Chun-Shuo Chen Ph.D., University at Albany, State University of New York

### Adjunct Professor

Wen-Hsien Chen Ph.D., University of California, Berkeley

Gwo-Hshing Tzeng Ph.D., Osaka University

### Adjunct Assistant Professor

Jung-Yan Ph.D., University of Arizona

Ruey-Wen Hong Ph.D., Nation Taiwan University

## FACILITIES

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The Department has a computer center and fourteen laboratories equipped with more than twenty Linux workstations, in total more than two-hundred Pentium PCs, and plentiful multimedia equipment as well. Color laser printers, PDF Scanners are also available here for teachers and students' academic requirements. Servers including Mail & DNS Server、Wed Server、File Server、Print Server、Domain Controller are centralized in assistant interior room for unified management.

The Department equipped with Windows MSDN AA, which includes Windows operation systems at levels (2000/XP/2003), supportive programming development application (Visual Studio) and word processing software (Microsoft Office), etc. Moreover, we also have multimedia data processing software like Adobe Creative Suite、Macromedia Studio to provide students convenient tools for learning of information technology and system management.



## COURSES

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### Undergraduate Programs

The Department of Information Management offers a four-year program leading to the degree of Bachelor of Business Administration in Information Management.

A student must complete a minimum of 141 credit units of course work, of which 111 units are core courses. The core courses requirements are as follows:

Freshman: Calculus (4,4), Accounting (3,3), Managerial Mathematics (3), Introduction to Computer Science (3), Programming Design (3), Discrete Mathematics (3).

Sophomore: Statistics (3,3), Introduction to Information Management (3), Computer Organization and Architecture (3), Management (3), Operations Research (3), Algorithms (3), Operating Systems (3).

### Core Course:

Junior: System Analysis and Design (3), Computer Networks (3), MIS Panel Discussion (1), Project on Information Management I (2), Database Management (3), Two of the following five: Marketing Management(3), Financial Management(3), Operations Management(3), Strategy Management(3), Organization Behavior(3), One of the following three: Programming Languages(3), Theory of

Computing(3), Software Development Methods(3),

Senior: Project on Information Management (2).

### **MBA Programs**

The Graduate Institute of Information Management offers a two-year program leading to the degree of Master of Business Administration. A student must complete a minimum of 35 credits of course work, of which 11 are to be gained from required courses, 18 from elective courses, and the remaining 6 from the master's thesis.

The course requirements are as follows:

Information Management (3), Seminar on Information Management(2); Elective courses (2 out of 6): Information Technology & Competitive Strategy(3), Advanced Database Management(3), Distributed Information Systems(3), Advanced Computer Networks(3), E-Business(3), Knowledge Management(3).

### **EMBA Programs**

The program leading to the degree of EMBA requires a minimum of 42 credits of course work, including the Master's thesis. Of the 42 credits, 18 are to be gained from core required courses, 4~6 from core elective courses, 4 from group required courses, 8~10 from elective courses, and the remaining 6 from the master's thesis.

### **Ph.D. Programs**

The Graduate institute also offers a Ph.D. program with two tracks: Information Management and Information Technology. Both require a minimum of 32 units and a doctoral dissertation. Doctoral candidates must complete all the requirements in seven years or, if permitted, in nine years.

#### **Course Requirement:**

1. Core Courses: 7 units
  - a. Advanced Information Management(3)
  - b. Information Management Ph.D.Forum(I)(1)
  - c. Information Management Ph.D.Forum(II)(1)
  - d. Information Management Ph.D.Forum(III)(1)
  - e. Information Management Ph.D.Forum(IV)(1)
2. Elective Courses: 12 out of 25 units should be approved by dissertation advisor.
3. All PhD candidates must satisfy the information management breadth requirement in their PhD program at this department. The requirement is satisfied by mastering the content of 4 undergraduate courses: Computer Network, Database Management, Systems Analysis and Design, and Management. Competence may be demonstrated in one of two ways.
  - a. Satisfactory completion of the course or more advance equivalence at the IM department with a grade 60 or better.
  - b. Satisfactory completion of an equivalent course at another university with a grade of 60 or better.

To reiterate as a final note, students in our programs shall acquire the capabilities for information

management, strategic management, project management, network planning, systems analysis, design, and development, business renovation projects, etc.

## ACADEMIC ACTIVITIES

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1. Seminars are held once or twice every week. We invite experts, managers, and researchers from the public and private sectors related to the field of Computer Technology and Information Management.
2. Laboratories research performance seminars are held once every week.
3. The Department also sponsors or cosponsors symposia, workshops and short courses.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

In regard to undergraduate students, we expect them to become the new blood of information industry, invigorating particularly its technological and management advancements.

In regard to MS students, we expect them to become extraordinary maintainers of information industry, applying and developing informative systems, in a steady progress.

In regard to EMBA students, we expect them to become genuine masters of information industry, practicing their knowledge of information and business management in their professions.

In regard to Ph. D. students, we expect them to become solid pillars of information industry, creating and developing effective operative systems and management strategies based on their knowledge of information sciences and business management.

Briefly, students in our programs shall acquire abilities as follows: information management, strategy management, project management, network planning, system analyses, designation and development, business renovation projects, etc.

### ■ Further studies

Most of our graduates choose information management as the subject of their advanced studies. However, since our programs cover fields related to information as well as management, graduates may also choose any of the following fields for further studying: information sciences/engineering, technology management, industry management, management sciences, strategy science, business management, accounting and finance, etc.

### ■ Career options

Our interdisciplinary programs cover the many areas of information science, technology and management, in theory and in practice, emphasizing in particular foundational knowledge that will lay a solid ground for the students. Apart from the comprehensive selection of courses, our students have the opportunities to participate in computer-based administration of the University as well as projects sponsored by national research agencies or commercial entities. Their experience in developing and applying large-scale infor-

mation systems enables them to work as creative engineers in the software industry. Our rich curriculum also enables our students to work as professional managers in various businesses or even to launch business of their own. Our alumni work in prestigious companies, institutions, and international trusts and have earned high acclaims from the society.

It should be noted that alumni of our Department are not restricted to traditional areas of MIS, but rather can actively participate in newly developed business such as those related to design of databases and calculative methods. Other than undertaking software design, cases in EC and EDI, or some supporting information systems project within business, guide a few alumni nowadays are in charge of product development, users' interface design and maintenance, and information systems certifying as well as consulting. To summarize, the positions that our graduates are likely to hold are of a great variety, including software designer, technical engineer, system analyst, project manager, senior manager or consultant, information administrator(CIO), general manager(CEO), and so on.

## CONTACT INFORMATION

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2-23656142

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Website: <http://www.im.ntu.edu.tw>

E-mail: [im@im.ntu.edu.tw](mailto:im@im.ntu.edu.tw)





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80th Anniversary

# VIII. COLLEGE OF PUBLIC HEALTH



## Academic Units

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- Department of Public Health
- Graduate Institute of Health Policy & Management
- Graduate Institute of Occupational Medicine & Industrial Hygiene
- Graduate Institute of Epidemiology
- Graduate Institute of Health Care Organization Administration
- Graduate Institute of Environmental Health
- Graduate Institute of Preventive Medicine
- Master of Public Health Program
- Research Center for Environmental Health & Occupational Hygiene
- Research Center for Health Promotion
- Center for International Health Research
- Center for Health Insurance Research
- Center for Biostatistic Consultation & Research
- Center for Genetic, Environmental & Research

## The Present & Former Deans

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Ruey-Shiung Lin	(1993.08-1996.07)	Ruey-Shiung Lin	(2002.04-2002.09)
Chiu-Sen Wang	(1996.08-1999.07)	Jung-Der Wang	(2002.10-2005.07)
Chien-Jen Chen	(1999.08-2002.03)	Tung-liang Chiang	(2005.08-present)

## HISTORY

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In 1993, the College of Public Health was born from the College of Medicine as the eighth college of National Taiwan University so as to upgrade the standard and quality of public health in Taiwan. Currently, the College of Public Health consists of one undergraduate department and six graduate institutes, and master of public health program.

The Institute of Tropical Medicine, established in 1939, was the forerunner of the College of Public Health. After Taiwan was returned to the Republic of China at the end of the Second World War, the Institute of Tropical Medicine was renamed as the Graduate Institute of Public Health. In the early years, the Graduate Institute of Public Health aimed at training public health workers and conducting public health researches. It was not until 1965 that the Graduate Institute of Public Health began to offer master programs. A doctoral program was initiated twenty years later in 1985. Following the inauguration of the College of Public Health, four graduate institutes that were independent of the Graduate Institute of Public Health were established: Graduate Institute of Occupational Medicine and Industrial Hygiene (1993), Graduate Institute of Epidemiology (1994), Graduate Institute of Health Care Organization Administration (1995), and Graduate Institute of Environmental Health (1996). Afterwards, the Graduate Institute of Public Health was renamed as the Graduate Institute of Health Policy of Man-

agement in 1998, and the sixth graduate department, the Graduate Institute of Preventive Medicine, was set up in 2001. Recently, the Master of Public Health program was established in 2008.

The Department of Public Health, an undergraduate program, was established in 1972. To increase the versatility of the students, and help them to integrate academic learning into public health practices to meet the increasing societal demands in the future, summer internships and the Public Health Service Team have been offered each year since 1972. Both of these have become guiding traditions of the College.

## FEATURES

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The College of Public Health is a mini-National Taiwan University itself, with teaching and research activities involving disciplines not only in natural and biological sciences but also in humanities and social sciences. The essence of public health dictates that we concern greatly about the health rights of the people and pursue the ultimate goal of health for all. Our endeavors have been focused on disease prevention and health promotion, environmental protection and sustainable development, and the operation and management of health care industry.



## RESEARCH

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Unique research contributions of the NTU College of Public Health have included: the Taiwan island-wide control of goiter with iodized salt, the control of the black-foot disease, the control of occupational diseases, nasopharyngeal carcinoma research, the prevention and control of hepatitis and hepatoma, the formulation of arsenic standards in water, the surveillance and control of occupational pollutants, the health care of the elderly, tobacco control, gene and environment research, and health reform and National Health Insurance policy.

Besides, the College has six research centers: Center for Health Insurance Research, Center for Health Promotion Research, Center for International Health, Center for Biostatistics Consultation, Research Center for Genes, Environment and Human Health and Center for Environment and Occupational Health Research. These centers were established in response to indigenous health needs in Taiwan, and are engaged in activities of research and service provision that focus on specific issues in Taiwan.

## GOALS

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The missions of the College of Public Health are to provide the best education to nurture future public health scientists, practitioners, and leaders in

Taiwan and Asia, to integrate research findings in formulating the best public health policies at various levels, to promote human health, and finally to reach the idealistic goal of “Health for All”. The College of Public Health will develop programs and projects in the three following areas:

1. Incorporate frontiers in molecular signature, biomarkers, genetics, epidemiology, biostatistics, bioinformatics, and health behavior sciences in formulating the evidence-based approach to making continuous improvements in health promotion and preventive medicine;
2. Develop technologies in environmental hazard identification, exposure assessment and risk assessment for formulating evidence-based environmental and occupational health policies;
3. Health sector reforms, focusing on research and demonstration in quality and efficiency of health care, long-term health-care system, health information system, and health insurance policies.

## CONTACT INFORMATION

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# 1. DEPARTMENT OF PUBLIC HEALTH

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## INTRODUCTION

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The Graduate Institute of Public Health, NTU had three predecessors, including Hygiene Laboratory, Institute of Tropical Medicine, and Department of Ho-Sen of Taipei Imperial University during the Japanese colonial period. In addition to engaging in research, these predecessors also offered several instruction programs, such as Entomology, Environmental Health, and Public Health Administration, for medical students in Taiwan at that time.

After Taiwan's Retrocession in 1945, the Taipei Imperial University was renamed National Taiwan University and the Hygiene Laboratory was renamed Department of Public Health in 1948. The Institute of Tropical Medicine was reorganized in 1951 to become the Institute of Public Health in the College of Medicine, which provided post-graduate training for physicians and collaborated closely with the Department of Public Health in offering research, teaching, and service for the College of Medicine. The Institute of Public Health offered extramural training programs for physicians of health care agencies, administrators, public health nurses, and other public health workers since 1955. With funding from local

governments, the Taipei Public Health Teaching and Demonstration Center was established in 1958. The Center had spared no pains to be active in educational outreach of Public Health by providing training for the students of the College of Medicine.

When the College of Public Health was founded in 1993, the Department of Public Health was renamed Department of Social Medicine which was still affiliated to the College of Medicine.

The Department of Public Health, established in 1972 in the College of Medicine, is now a Department in the College of Public Health. At present, there are over 800 alumni from the undergraduate programs. Many of them are working in the Executive Yuan Department of Health, the Environmental Protection Administration, local health agencies, and hospitals.

The undergraduate programs in public health at NTU include health policy and management, hospital administration, epidemiology, biomedical statistics, environmental health, and industrial hygiene. The objective of the curriculum is to offer graduating seniors an academically sound as well as practical background in public health.

A minimum of 128 credits in course work is required to receive a B.S. degree in public health. The Department offers laboratory, epidemiology laboratory, population and health statistics, health care for women and children, health education, medical and health laws, health policy and management, environment health, field work in public health, and current topics in public health. In the summer of the senior year, students are mainly engaged in field work at health agencies and factories.

## FACULTY

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Full-time : 44

Part-time : 4

Ph.D. Degree : 44

M.S. Degree : 3

B.S. Degree : 1

### Honorary Professor

Wang, Chiu-Sen      Doctor of Philosophy,  
California Institute of  
Technology

### Chairman/ Professor

Chen, Wei-Jen      Sc.D., Harvard University

### Full-time

#### Professors

Chie, Wei-Chu      Doctor of Philosophy,  
National Taiwan University

Wang, Gen-Shuh    Doctor of Philosophy, State  
University of New York at  
Albany

Hsiao, Chuhsing Kate    Ph.D., Carnegie Mellon  
University, USA

#### Associate Professor

Yang, Ming-Chin    Doctor of Public Health,  
University of Texas

Lew-Ting, Chih-Yin    Doctor of Philosophy,  
University of California at  
Los Angeles

Wu, Chang-Fu      Doctor of Philosophy,  
Department of  
Environmental Health,  
University of Washington

**Assistant Professor**

Kuo, Po-Hsiu Ph.D, National Taiwan University

**Adjunct Professor**

Yu, Ming-Whei Ph.D., National Taiwan University

Chang, Shu-Hui Ph.D., The Johns Hopkins University School of Hygiene and Public Health

Chen, Hsiu-His Ph.D., Cambridge University

Cheng, Shou-Hsia Ph.D., Yale University Research Methods in Health Care Services

Chan, Chang-Chuan Sc.D., Harvard University

Wang, Jung-Der Sc.D., Harvard University

Chen, Chih-Chieh Ph.D., University of Cincinnati

Cheng, Tsun-Jen Sc.D., Harvard University

Lee, Wen-Chung Ph.D., National Taiwan University

King, Chwan-Chuen Ph.D., University of California at Los Angeles

Lin, Jia-Ming Ph.D., University of Cincinnati

Chiang, Tung-liang Sc.D., The Johns Hopkins University

Yen, Lee-Lan Sc.D., The Johns Hopkins University

Lai, Mei-Shu M.D. and Ph.D., National Taiwan University

Su, Syi Sc.D., Johns Hopkins University

Lin, Neng-Pai Professor Ph.D., Univ. of Ohio State

**Adjunct Associate Professor**

Hwang, Yaw-Huei Ph.D., University of Cincinnati Industrial Hygiene

Chung, Kuo-Piao Ph.D., The Johns Hopkins University

Chen, Pau-Chung Ph.D., University of London

Ma, Yee-Chung Ph.D., University of Delaware

Chang, Ching-Wen Ph.D., University of Cincinnati

Chang, Chueh Sc.D., The Johns Hopkins University

Chang, Ray-e Ph.D., University of Texas

Chen, Duan-rung Ph.D., University of Columbia

Cheng, Ya-wen Sc.D., Epidemiology, Harvard School of Public Health

Chien, Kuo-Liong M.D. and Ph.D., National Taiwan University

Chen, Chia-Yang Ph.D., University of North Carolina at Chapel Hill

Tsai, Shih-Wei Ph.D., Department of Environmental Health Sciences, University of California, Los Angeles

Wu, Kuen-Yuh Ph. D., North Carolina State University



**Adjunct Assistant Professor**

Fang, Chi-Tai	Doctor of Medicine, National Taiwan University
Huang, Jiun-Hau	Sc.D., Harvard University
Chen, Yen-Ching	Sc.D., Harvard University
Lin, Ching-Yu	Ph.D., Pharmacology & Toxicology, University of California, Davis
Lee, Yung-Ling	Ph.D., National Chengkung University
Wang, Sheng-Wei	Ph.D., Environmental Sci- ences, Rutgers University, New Jersey

**Part-time****Associate Professor**

Wang, Cheng-Hsiung	Bachelor of Agriculture, National Chung Hsing University, W.H.O. fellowship DIP course
Hsu, Hsu-Mei	Master of Public Health, The Johns Hopkins University,

**Assistant Professor**

Fan, Bih-Yuh	Master of Hospital Adminis- tration, China Medical College
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**Lecturer**

Lee, Sheng-Long	Master of Law, National Taiwan University
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**FACILITIES**

In the beginning of 2006, the Department of Public Health is moved to its current location with more commodious spaces, including faculty offices, seminar rooms and student offices so as to optimize the teaching/learning environment. Student offices include the undergraduate student association office, the Public Health Service Team office and one office for each grade. Student offices are in close proximity to faculty offices and seminar rooms located on the 5th, 6th and 7th floors in order to promote mutual interaction and support among teachers and pupils.

The Public Health Building offers a number of professional resources for students learning, such as the Statistical Consultation Room and High-level Computer Room which are located on the 5th floor. The building is also equipped with modern research facilities in both 9th and 10th floors, such as P1 and P2 levels Biological Labs, the Environmental Chemistry Lab, the Air Pollution and Health Effects Lab, the Environmental Microbiology Lab, and the Environmental Exposure Assessment Lab. In addition, there are the organic and inorganic chemistry core facilities equipped with analytical instruments, the balance room, the CO<sub>2</sub> incubator room, the refrigeration room, and water distillation and de-ionization facilities. Those facilities mentioned above could indeed culminate the students to acquire more comprehensive Lab training experience.

Besides, NTU Medical Library provides our department with extensive resources both qualitatively and quantitatively, including collections and periodicals. To meet the requirements of our professors and students, the College of Public Health annually funds the Medical Library to provide academic books and periodicals in public health. All of the hardware facilities of the College of Public Health and College of Medicine, including all teaching facilities, classrooms, equipment, and conference halls, are open for public use.

To date, there are more than 5,000 Chinese and English books, 4,000 E-Journals, and 130,000 periodicals in the field of public Health and Medicine.

## COURSES

A minimum of 128 credits in course work is requested to pursue a B.S. degree in public health. The Department of Public Health offers a constellation of diversified courses from Science to Art. Therefore, we employ not only teachers who specialize in relevant professional fields, but part-time teachers who work for government health department or environmental protection department so that students can be trained well from theories into practices. Junior students can choose one of major areas in accordance with preference, including, epidemiology/preventive biostatistics, health policy/health care management, occupational/environmental health. Besides, stu-

dents in the third year are obliged to practice in at health agencies and factories related to public health. It enables students not only to apply theory to practice but also to develop communication skills with folk people.

### For those who enroll after academic year of 2009 Graduation Credits(128):

1. General Courses(18)
2. Cross-disciplinary General Education(12)
3. Basic Natural Sciences(12-14)  
Calculus(General Mathematics) B(6), General Zoology B or General Biology(3)/(4), General Physics B(3), General Chemistry C and Lab(4)  
【Any One of the Two】
4. Basic Social Sciences(3)  
Economics A(3), Sociology D(3), Psychology C(3) 【Any One of the Three】
5. Basic Medical Sciences(11)  
Anatomy(3), Physiology(4), Microbiology and Immunology + Lab(3)
6. Basic Public Health(26)  
Introduction to Public Health(2), Biostatistics(I)(3), Biostatistics(II)(3), Epidemiology(2), Case Study on Epidemiology(2), Fundamentals of Environmental Health(2), Laws and Regulations in Medicine and Health(2), Health Education(2), Occupational Health(2), Principles of Public Health Administration(2), Field Practice in Public Health(4)
7. Group Required courses(16-36)  
Group “Epidemiology and Preventive Medicine”(20), Group “Health Policy and Health

Care Organization Administration”(26), Group “Environmental and Occupational Health”(31-36), Group “Biomedical Statistics”(16) 【Any One of the four】

#### 8. Selective Courses(9-31)

## ACADEMIC ACTIVITIES

Since the areas of public health are extensively wide, the research topics are abundant. Conferences and academic speeches regularly organized by colleges and departments are many and well attended. Besides, professors and students of College of Public Health attend the conferences of the Taiwan Public Health Association and other related societies to present papers and research achievements every year. The quality of research of public health is substantially improved due to such effort. Every summer vacation, we make up "Public Health Service Team" to serve the various communities and conduct a survey of hygiene and health care.

Many students take part in a community service project for a period of seven days during the summer. The project provide an excellent opportunity for students to interact with local communities and to work on practical problems in public health.

Students in junior are also encouraged to participate in applying for NSC research projects and take courses of studying on special topic in public

health, in order to learn research capabilities and develop logical thinking.

## CAREERS AND FURTHER STUDIES

### ■ Core competencies (abilities)

The students are supposed to learn core competencies, such as:

- (1) Basic Biomedical Science
- (2) Basic Quantitative Analysis and Biostatistics
- (3) Epidemiology
- (4) Environmental Health Sciences
- (5) Health Policy and Management
- (6) Social and Behavioral Sciences

### ■ Further studies

The Students can apply to graduate school related to public health in the country for further education. For example, in the College of Public Health at National Taiwan University has six graduate institutes, including:

- Institute of Health Policy and Management
- Institute of Occupational Medicine and Industrial Hygiene
- Institute of Epidemiology
- Institute of Health Care Organization Administration
- Institute of Environmental Health
- Institute of Preventive Medicine

If the students want to go abroad for further study, the relevant graduate institutes of public health offer more choices and opportunities. Prominent

examples include Harvard School of Public Health, Johns Hopkins University, etc.

### ■ Career options

The directions to employment for the students of the Public Health Department are various and general. It can be chosen by student's individual interests. For example:

- (1) Teaching and Research - - Serve as a biology or health related teacher in all levels of primary and secondary school after finishing the additional required courses for Professional Education.
- (2) Research Fellowship - - Serve as research fellow in a research organization, such as Academia Sinica, National Health Research Institute, etc, or in a research and development department of health care in the industry sector.
- (3) Professional Technician - - Get a technician's certificate by taking the required examination. Then, serve as a health management professional, industrial safety technician, environmental examiner, professional technician, etc.
- (4) Administration Manager - - Serve as administration managers in the government's health and environmental protection organizations, or in various health care organizations.
- (5) Statistical Consultant - - All kinds of biotech companies, pharmaceutical factories and health and environmental foundations need statistical consultants who have profession health knowledge. The students also can use their bio-statistical background to serve in a market

research company, statistical consulting company or insurance business company.

Furthermore, the students may develop a career in actuarial business.

- (6) Journalist - - Serve as a health and medical reporter in the press, or as an editor in a health related magazine. Moreover, serve as even a presenter in a health related program. In fact, all trades and professions need various professionals with different specializations, and this certainly includes public health professionals.

## CONTACT INFORMATION

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## 2. GRADUATE INSTITUTE OF HEALTH POLICY AND MANAGEMENT

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### INTRODUCTION

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The Institute of Health Policy and Management (IHP&M), previously known as the Institute of Public Health (IPH), was established in 1951. In 1961 and 1985 the IPH initiated its master program and Ph.D. program, separately. In 1998, the IPH was renamed the Institute of Health Policy and Management, with its new identity and missions.

The IHP&M offers both master and doctoral degree programs. A special on-service master degree program designed for professionals and public health officers was further established in 2001. Currently, the student body of IHP&M consists of 28 doctoral students, 36 master students, and 19 master students in the on-service master degree program.

On the faculty of the IHP&M are 6 full-time professors, 3 joint professors, and 4 part-time professors. These professors are leading figures in their fields of expertise.

On-going research projects of the IHP&M include, health and long-term care policy research for the elderly, a cohort study of newborns to investigate multiple determinants of health outcomes, a cohort

study of children and adolescents to assess impacts of various factors on health behaviors, studies on women's health and gender-specific health issues, studies of organizational behaviors in the health care industry and of health services quality, studies of care seeking behaviors, epidemiologic studies with regard to work characteristics and socioeconomic status, etc. These research activities have generated publications both in domestic and international journals, with results that are of great value for policy makers. From 2001 to 2008, faculty members of the IHP&M had published 12 SCI papers, 6 SSCI papers, 18 papers in other international journals, 55 papers in domestic journals, 61 conference papers, and 34 scientific reports.

Curricula of the IHP&M are designed with emphases on developing students' critical and independent thinking as well as for promoting teamwork. Courses at the beginning level include research methodology, data analysis, principles of health policy and behavior, and principles of health behaviors science. Advanced courses include: long term care, health sociology, health economy, and analysis of health policy, community intervention, health promotion, public mental health, women's health, and care seeking behaviors. Students benefit further from being able to cross-register for

courses offered by the National Yang-Ming University, Departments of Public Health and Health Welfare, and the National Taiwan Normal University, Department of Health Education.

We are devoted in our research work to improve the quality of health policy and enhance public health. To achieve this goal, members of the IHP&M are expected to be actively involved in prospective research projects and to take lead in health policy research in the Asia-Pacific region. The IHP&M is also devoted to education. Students are encouraged to get involved in the nation's policy-making processes. Through education and involvement in policy-making, we aim to achieve the final goal of enhancing public health in Taiwan.

## FACULTY

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Full-time: 6

Joint: 3

Part-time: 4

Ph.D. Degree: 14

### Director/ Professor

Yawen Cheng      Sc.D., Epidemiology,  
Harvard School of Public  
Health

### Full-time

#### Professor

Lee-Lan Yen      Sc.D., The Johns Hopkins  
University

Tung-liang Chiang      Sc.D., The Johns Hopkins  
University

Shou-Hsia Cheng      Ph.D., Yale University

#### Associate Professor

Chueh Chang      Sc.D., The Johns Hopkins  
University

#### Assistant Professor

Jiun-Hau Huang      Sc.D. Harvard University

### Joint

#### Professor

Chin-Hua Chang      Ph.D., University of Iowa

Mei-Shu Lai      M.D. and Ph.D., NTU

Chih-Yin Lew-Ting      Ph.D., University of  
California, Los Angeles

### Part-time

#### Professor

Chih-Liang Yang      Ph.D., University of  
Michigan



Chung-Fu Lan Dr.P.H., The Johns Hopkins University

Te-Hsiung Sun Ph.D., University of Michigan

#### Associate Professor

Weng-Hong Huang Ph.D., University of Minnesota

## FACILITIES

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Instruments: Slide Projectors, 3 LCD Data Projector, Radio Cassette-Recorder, Video Camera, Sphygmomanometers Skinfold Measure, Glucometer, Video Editing System, Imagelink Retrieval Workstation, Automatic Reflexodiagnostic System etc.

## COURSES

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### Compulsory subject courses for full-time master candidates:

Research Methods in Health Policy (3), Statistics (3), Seminar on Public Health Policy Research Methods I (1), Seminar on Public Health Policy Research Methods II (1), Health Policy and Behavior Principle (3), Public Health Ethic (1).

### Compulsory subject courses for part-time master candidates:

Comprehensive Topics on Health Policy and Health Behavior (2), Data Analysis of Health(2), Research Methods in Health Services (2), Seminar

on Health Policy and Management (2).

### Compulsory subject courses for MPH candidates:

- (1) Principles in Health Policy
- (2) Public Health Ethics
- (3) Principles of Epidemiology
- (4) Medical Statistics(I)
- (5) Fundamental on Occupational
- (6) Environmental Health
- (7) Health Social Science
- (8) Topics on Health Care System
- (9) System Analysis of Taiwan's National Health Insurance
- (10) Health Industry and Policy Development

### Compulsory subject courses for doctoral candidates:

Seminar on Health Policy and Behavior I (1), Seminar on Health Policy and Behavior II (1), Special Topics in Health Policy and Behavior (2). Choose one option from the following: Special Topics in Society and Health (2), Special Topics in Long Term Care (2), Special Topics in Health Economics (2), Special Topics in Public Mental Health (2), Special Topics in Health Promotion (2), Health, Culture and Society (2), and Special Topics in Labor and Health (2).

## ACADEMIC ACTIVITIES

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1. A faculty seminar is regularly held every month. Distinguished scholars from here and abroad are invited to give lectures.
2. Our Institute also sponsors or cosponsors symposiums and workshops.
3. Editing Annual Report of Faculty Research Publications.

## CONTACT INFORMATION

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# 3. GRADUATE INSTITUTE OF OCCUPATIONAL MEDICINE AND INDUSTRIAL HYGIENE

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## INTRODUCTION

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The Institute of Occupational Medicine and Industrial Hygiene was established in 1993. This is the first graduate institute specializing in occupational medicine and industrial hygiene in Taiwan. The mission of the Institute of Occupational Medicine and Industrial Hygiene is to advance the health of all people in occupational and community settings in Taiwan, and around the world through teaching, research and services in occupational and environmental health.

Faculty members in the institute investigate causes, mechanisms and, prevention measures of environmentally and occupationally related health issues, provide advanced education programs of occupational health with master and doctoral degrees, and provide scientifically based public health services to the public, governments, industries, and the labors. Research approaches range from the molecular to the epidemiologic, in physical scales of nano to macro, and by multiple disciplines of physics, chemistry, biology, sciences and ergonomics.

The Institute of Occupational Medicine and Industrial Hygiene focuses on complex yet important public health problems that require integrated contributions of many advanced specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include chemists, engineers, epidemiologists, ergonomics, physicians, molecular biologists, exposure assessors, and risk assessors.

Teaching and research activities of the institute are carried out through six concentrations: (1) occupational medicine, (2) industrial hygiene, (3) occupational and environmental epidemiology, (4) risk assessment, (5) environmental toxicology genomics, (6) aerosol technology, (7) ergonomics, (8) exposure assessment, (9) quality of life and health assessment.

## FACULTY

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Full-time Professors: 10

Associate professors: 3

Adjunct

Professors: 3

Associate professors: 1

Assistant professors: 1

Lecturer: 1

Teaching assistants: 1

### Director/Professor

Tsun-Jen Cheng      M.D., Taipei Medical  
University  
Sc.D., Harvard University

### Full-time Faculty

#### Professor

Jung-Der Wang      M.D., National Taiwan  
University  
Sc.D., Harvard University

Chang-Chuan Chan      Sc.D., Harvard University

Chih-Chieh Chen      Ph.D., University of  
Cincinnati

Pau-Chung Chen      Ph.D., University of  
London  
M.D., Kaohsiung Medical  
College

#### Associate Professor

Yaw-Huei Hwang      Ph.D., University of  
Cincinnati

Kuen-Yuh Wu      Ph.D., North Carolina State  
University

#### Assistant Professor

Wan-Yu Yeh      Ph.D., National Taiwan  
University

### Joint-appoint Faculty

#### Professor

Min-Yung Lai      M.D., Ph.D., National  
Taiwan University

Yang-Chyuan Chang      M.D., National Taiwan  
University

Shoei-Sheng Lee      Ph.D., Ohio State University

Shiou-Hwa Jee      M.D., Ph.D., National  
Taiwan University

Yue-Liang Guo      M.D., National Taiwan  
University  
Sc. D., Johns Hopkins  
University

#### Associate Professor

Chang-fu Wu      Ph.D., University of  
Washington

### Adjunct Faculty

#### Professor

Shu-Wei Yu      Ph.D., Tulane University

Hong-Wei Shiao      Ph.D., Michigan University

Lung-Chi Chen      Ph.D., New York University

#### Associate Professor

The-Sheng Su      M.P.H University of  
California at Berkeley

#### Assistant Professor

Chung-Li Du      Ph.D., National Taiwan  
University

Yi-Ping Lin      Ph.D., National Taiwan  
University

**Lecturer**

Jong-Dar Chen      M.S., National Taiwan  
University

**Teaching Assistant**

Yi-Chen Chen      M.S., National Taiwan  
University

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**COURSES**

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**Master Degree**

Core course for all student: Environmental and Occupational Health Case Conference (4 semester), and Environmental and Occupational Health tract: methods of epidemiologic research , statistics methods in environmental & occupational health , fundamental on occupational health , environmental and occupational toxicology, environmental and occupational disease or enterprise health management .

Industrial Hygiene tract: monitoring for health hazard at work I, II, industrial hygiene engineering I, II, exposure assessment.

Risk Assessment and Management tract: risk assessment, environment, society and public health

**Doctoral Degree**

Environmental and Occupational Health Seminar (4 semester, English), Special topic on environmental occupational health I, II ( English).

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**ACADEMIC ACTIVITIES**

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Our institute regularly host seminars with Institute of Environmental Health inviting domestic and international scholars for presentation. We also hold a poster day each semester inviting master and doctor students to present their thesis. Through this activity, we exchange research knowledge and experience.

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**CONTACT INFORMATION**

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# 4. GRADUATE INSTITUTE OF EPIDEMIOLOGY

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## INTRODUCTION

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Medical College of National Taiwan University set up an M.S. program at the Institute of Public Health in 1961 that was the first academic institute to emphasize epidemiological research in Taiwan. At that time, the institute had three divisions, one of which included preventive medicine, epidemiology and biomedical statistics. This division was the predecessor of the Institute of Epidemiology. The Institute of Epidemiology was established in 1994, and it has become the first and the only professional institute of epidemiological research in Taiwan. Under the plan and the design of Professor Chien-Jen Chen, the first director of the Institute, we were permitted by the MOE to open both M.S. and Ph.D. programs at the beginning. Our research fields consisted of three divisions: Epidemiology, Biomedical Statistics and Preventive Medicine. The Division of Preventive Medicine became an independent institute in August 2001. We presently have 10 faculty members, 1 teaching assistants and a staff member. We annually recruit 28 students of M.S. program (16 for Epidemiology, 12 for Biomedical Statistics) and 13 students of Ph.D. program (6 for Epidemiology, 7 for Biomedical Statistics).

The Institute of Epidemiology aims to pursue cutting-edge research. The specialties of our professors are diversified, therefore creating an inspiring learning environment for the students. Through the efforts of teachers and students, the Institute conducts outstanding research. Among the departments in the College of Public Health, the Institute published most papers listed in the SCI. Three teachers have won the Outstanding Research Award of National Science Council (Ming-Whei Yu, John Tai, Wei J. Chen). In addition, our faculty members have been granted Excellent Research Award of National Science Council in successive years. In other research awards sponsored by research foundations, several faculty members have been granted as recipients, such as Excellent Research of K.P. Chen Preventive Medicine Foundation (Ming-Whei Yu, Wen-Chung Lee), Young Investigator Award of Academia Sinica (Wen-Chung Lee), Medical Award of Green Apricot Foundation (Wei J. Chen, Tony Hsiu-Hsi Chen), Research Achievement Award of National Taiwan University (Wen-Chung Lee). To strengthen our faculty members and develop our students, we arrange the course offerings and student activities carefully. For example, we set the obligatory credits at the lowest limit, and suggest that students take more elective courses. To



increase the interaction in research among teachers and students, we publish annual report of research, which collect the abstracts of published papers of our faculty members. In addition to doing research, our faculty members write textbooks. Professor



John Jen Tai first published Introduction to Biomedical Statistics in 1998 and then Genetic Epidemiology: Genetic Design and Analysis Methods for Gene Mapping in 2002. Their spirit in writing textbooks will inspire other faculty members to follow suit and write more useful textbooks.

## GOALS

The goals of the Division of Epidemiology are to train students to be advanced epidemiologists to investigate community diseases and detect outbreaks, to study disease risk factors and pathogenic mechanisms, and to provide the methods of disease prevention, health promotion, and life prolongation. To compete in international competitions in research and transitions of disease types in Taiwan, the future directions of the Division include developing methods of epidemiology and genetic epidemiology, epidemiological research of infectious diseases, psychiatric diseases and chronic diseases. Meanwhile, the directions of the Division of Biomedical Statistics are to let students to obtain sufficient knowledge in the development, design, and implementation of statistical principles, and to experience in cooperation in biomedical research. The major themes of current research include genetic statistics analysis, general linear models, factor analysis, path analysis, survival analysis, LISREL models, longitudinal evaluation, Bayesian analysis, clinical trial, statistical in epidemiology, statistical modeling, and transmission model of infection diseases.

While the Institute of Epidemiology is not a new one, it still has much to learn in academia. In the teaching field, the amount of students is increasing; how to stimulate interactions between professors and students is a challenge. In research, the rapid progress of the human genome project is impacting

epidemiology and biomedical statistics substantially. In past few years, many professors have adjusted their research direction to genetics. We face the challenge to master some vital new topics in the field. In the presentations of research results, the "consciousness transformations" of the research community in Taiwan have passed beyond the stage of pure quantitative assessment. Our next goal should be to emphasize the achievements in subject matter itself. From the point of view of public health, we will face greater challenges to actively and effectively convert the research results into relevant policies. These are not only be our challenges, but also our goals.

## FACUTY

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Full-time Professors: 9

Adjunct Professor: 6

Adjunct Associate Professor: 0

Part-time Professor: 3

Part-time Associate Professor: 4

Teaching Assistant: 1

### Director/ Professor

Wen-Chung Lee      Doctor of Philosophy, NTU

### Emeritus Professor

Tung-Ming Lin      Doctor of Medicine, Japanese Medical College, Japan

### Full-time

#### Professor

Chwan-Chuen King      Doctor of Philosophy, University of California Los Angeles, USA

Ming-Whei Yu      Doctor of Philosophy, NTU

Wei J. Chen      Doctor of Science, Harvard University, USA

Jen John Tai      Doctor of Philosophy, Medical University of South Carolina

Shu-Hui Chang      Doctor of Philosophy, Johns Hopkins University, USA

Hsiu-Hsi Chen      Doctor of Philosophy, Cambridge University, UK

#### Project assistant professor

Tai-Hung Wen      Doctor of Philosophy, NTU

Pi-Hua Liu      Doctor of Philosophy, NTU

#### Assistant Professor

Chi-Tai Fang      Doctor of Philosophy, NTU

**Adjunct Professor**

Chen-Hsin Chen	Doctor of Philosophy, Stanford University, USA
Wen-Harn Pan	Doctor Philosophy, Cornell University, USA
Hung Chen	Doctor of Philosophy, University of Californian at Los Angeles, USA
Hai-Gwo Hwu	Doctor of Medicine, NTU
Chuhsing Kate Hsiao	Doctor of Philosophy, Carnegie Mellon University, USA

**Part-time****Professor**

Ling-Ling Hsieh	Doctor of Philosophy, Columbia University, USA
Jing-Shian Hwang	Doctor of Philosophy, Harvard University, USA
Chien-Jen Chen	Doctor of Science, Johns Hopkins University, USA

**Associate Professor**

Mei-Shan Ho	Doctor of Medicine, Indiana University, USA; Master of Public Health, Harvard University, USA
Ming-Yi Liao	Doctor of Veterinary Science, NTU
Chen-Yang Shen	Doctor of Philosophy, University of North Carolina, USA
Wei-June Chen	Doctor of Philosophy, University of California at Los Angeles, USA

**FACILITIES**

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Our facilities include: biomedical statistical consulting center, molecular and cellular laboratory, seroepidemiologic laboratory, genetic laboratory, virological laboratory, biospecimen bank, and computer network. Our equipment in these laboratories include: personal computers, Macintosh computers, genetic work station, high performance liquid chromatography, atomic absorption spectrometry, chemical hood, serum chemistry auto-analyzer, enzyme-linked immunosorbant assay reader, high-pressure autoclave, cell counter, laminar flow, stirrer, distilled water generator, CO2 incubator, DNA analysis system, MJ PCR, spectrophotometer, centrifuger, speed vac, hybridization oven, IS-500 imager, pH meter, mixer, dry bath, phase contrast microscope, Dotting machines, CO2 hood, ultra-low temperature freezer, computer-aided nitrogen freezer, ultrasonography, colposcope, spirometer, computerized electrocardiogram, balance, neuropsychological test batteries, 3 LCD data projector with document imaging camera, etc..

**COURSES**

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There are two programs in teaching and research in the institute: general epidemiology, biomedical statistics. Besides, the Doctor Degree of Preventive Medicine is managed with the institute of Preventive Medicine. The program in general

epidemiology offers courses such as: Principles of Epidemiology, Biomedical Statistics, Epidemiological Study Design and Data Analysis, Cases Study on Epidemiology, and Special Seminar on Epidemiology. The program in biomedical Statistics, Mathematical Statistics, Seminar on Biostatistics, Generalized Linear Model, Advanced Statistical Inference, and exciting courses on Biomedical Statistical Consultation. Moreover, there are many optional courses covering various topics in epidemiology, biostatistics and preventive medicine. E.g. epidemiology of chronic disease, epidemiology of infectious disease, genetic epidemiology, psychiatric epidemiology, theoretical epidemiology, statistical genetics, Bayesian statistical analysis, survival analysis, health life quality, disease screening, community medicine, clinical trials, decision making in preventive medicine, etc.

## Required Subjects

### Doctor Degree

#### 1.Division of Epidemiology: Advanced Methods in

Epidemiology(2), Special Seminar on Epidemiology (I)(1), Special Seminar on Epidemiology (II)(1), Design of Teaching Module in Epidemiology(2), Case Study in Epidemiologic Research (I)(1), Case Study in Epidemiologic Research (II)(1)

#### 2.Division of Biostatistics: Medical

Statistical Consultation I(2), Medical Statistical Consultation II(2), Advanced Medical Statistical Consultation I(2), Advanced Medical Statistical Consultation II (2), Seminar on Biomedical Statistics I (1), Seminar on Biomedical Statistics II (1), Seminar on Biomedical Statistics III (1), Seminar on Biomedical Statistics IV (1)

### Master Degree

#### 1.Division of Epidemiology: Medical

Statistics I (3) 、Principles of Epidemiology (2) 、Epidemiological Study: Design and Data Analysis (2), Case Study in Epidemiologic Research (1), Study Design of Epidemiology (1)

#### 2.Division of Biostatistics: Medical

Statistics I (3), Medical Data Analysis I (2), Medical Data Analysis II (2), Seminar on Biomedical Statistics I (1), Seminar on Biomedical Statistics II (1)

## ACADEMIC ACTIVITIES

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The institute holds a faculty seminar or guest speech several times per month, and sponsors occasional academic symposia. By inviting scholars and specialists of relevant fields to give talks, these activities provide the opportunities for communications and discussions. In our course curriculum, we also arrange various seminar classes to intensify student responsiveness, comprehension, and expression. We publish an annual report of faculty research achievements and activities.

## CONTACT INFORMATION

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# 5. GRADUATE INSTITUTE OF HEALTH CARE ORGANIZATION ADMINISTRATION

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## INTRODUCTION

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The major goal of the Institute of Health Care Organization Administration (IHCOA) is to develop various graduate programs for providing high and middle level professional training in Health Care Organizations.

Three kinds of graduate programs have been established: a master program for college undergraduates, a master program for executives in Health Care Organizations, and a doctoral program. The doctoral program, formerly affiliated with the Institute of Public Health, has been moved to the Institute (IHCOA) and integrated into the master programs in 1998. The executive program of Hospital Human Resource Management and Development was founded in 1997 but closed in 2002. The program for executive level was started in 2000.

## FACULTY

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### Director

Ming-Chin Yang Dr.P.H., Univ. of Texas

### Full-Time

#### Professor

Syi Su Sc.D., Johns Hopkins Univ.

Neng-Pai Lin Ph.D., Univ. of Ohio State

Su-Ming Hsu M.D., National Taiwan Univ.

Jin-Chuan Sheu DMsc, National Taiwan Univ.

#### Associate Professor

Ray-E Chang Ph.D., Univ. of Texas

Kuo-Piao Chung Ph.D., Johns Hopkins Univ.

Duan-Rung Chen Ph.D., Univ. of Columbia

#### Assistant Professor

Heng-Shuen Chen Ph.D., National Taiwan Univ.

### Part-Time

#### Professor

Wei-Jao Chen D.M.sc, Tohoku Univ.  
MPH., Johns Hopkins Univ.

Chih-liang Yaung Ph.D., Univ. of Michigan

Chien-Te Fan Juris Doctor, Univ. of Puget Sound

William T. Lin D.B.A., Boston University

Ren-Jieh Kuo      Ph.D., Pennsylvania State University

Hsin-ginn Hwang      Ph.D., Univ. of Texas at Arlington

**Associate Professor**

Kuei Han      M.H.A., Univ. of Minnesota

Sing-chew Tam      MSA.& MA., Univ. of Michigan

Ya-Seng Hsueh      Ph.D., Univ. of Michigan

Fan Wu      Ph.D., National Taiwan Univ.

**Assistant Professor**

Chung-Liang Shih      Ph.D., National Taiwan Univ.

**Part-time Practical Teacher**

Wen-Cheng Chang      MS, National Taiwan Univ.

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## COURSES

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### Master Programs

The graduate institute offers a one to four-year Master Degree program. The minimum requirement of credits is 30, plus 6 credits of thesis. The curriculum designed for master program consists of three phases: The first phase includes statistical training, research methods and methodology. The second phase includes basics of management for Health Care Organizations, health economics and introductory courses on health policy and organizations. The third phase includes a series of practice-oriented advanced courses on Health Care Organizations, such as financial management, human resources management, quality assurance and management, inventory management, organizational behavior, independent studies, and health informatics, etc. Students are provided with a widespread knowledge of management for Health Care Organizations and a solid professional training in health care administration prior to their graduation.

### Executive Master Programs

The executive master program offers a Master's Degree, which has a maximum limit for study of six year. The minimum number of credits required is 42, plus 6 credits of thesis. The maximum number of credits the students can take each semester is ten.





## Doctoral Programs

The doctoral program offers Ph.D. Degree with a maximum year for study of seven years. The minimum number of credits required is 24, plus 12 credits of dissertation. Doctoral Program courses are distributed across the following three major study areas:

1. Health Care Organization Administration:  
Organizational Behavior, Strategic Management, Human Resource Management, and Quality Management.
2. Quantitative and Information Management:  
Operations Research, Simulation, Information Management, and Financial Management.
3. Health Care System:  
Health Care System, Health Economics, Medical Sociology, Medical Laws, Policy Evaluation, Health Care Insurance, and Long Term Care.

## ACADEMIC ACTIVITIES

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This institute organizes regular seminars weekly; it also invites guest speakers in related areas on a less regular basis. In order to exchange the experience of teaching and research, faculty members also hold conferences jointly with faculty of other institutions.

The current research is concentrated on three major topics: health care organization administration, quantitative and information management and health care delivery system. Results are presented in relevant journals and conferences.

## FUTURE PROSPECTS

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The course planning is aimed at meeting dynamic social changes, so that the students, after graduation, can apply what they learned. In the near future, we will also incorporate management-related courses of health care industry to reflect the newly emerged demands.

As for research, besides continuing their own research projects, faculty members integrate into interdisciplinary teams to conduct more advanced and profound research so as to upgrade institute research to a global level and impact.

As for services, besides acting as consultants for various levels of governmental health organizations, our faculty members also give academic lectures at hospitals, and conduct projects for them.

In order to prevent faculty members from overload, we will re-evaluate the service pattern in order to achieve three wins in a more efficient way: strengthening faculty practice, student experience and hospital practice level.

## CONTACT INFORMATION

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# 6. GRADUATE INSTITUTE OF ENVIRONMENTAL HEALTH

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## INTRODUCTION

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The Institute of Environmental Health, established in August 1996, was originally the Division of Environmental Health and Management in the Institute of Public Health (IPH). The Institute of Public Health was organized in 1951 out of the Institute of Tropical Medicine, which was established during the Japanese era. In its early stage, IPH filled the role of conducting public health research and training the personnel on-the-job for local public health services. In 1961, IPH began to offer two master programs, Preventive Medicine and Public Health. In 1985, IPH initiated Ph.D. programs, including the Environmental Health Program for training specialists in environmental health. To meet the needs of society, the Ministry of Education authorized the establishment of the Division of Environmental Health and Management in 1991. The division separated from IPH to become the Institute of Environmental Health (IEH) in August 1996. In 1998, the Ph.D. program, originally one of the IPH programs, was also incorporated into the newly established IEH.

Based on the expertises of the faculties, the IEH focuses its teaching and research on the following fields: conventional environmental health, environ-

mental health technology, environmental health management, environmental toxicology, and environmental epidemiology. The goal is to train students solidly in environmental health, disease prevention, and health promotion, in research and in practice. The graduates of IEH are active in industry, government, as well as academia playing the roles of technicians, administrators and researchers.

The role of environmental health in disease prevention as well as health promotion evolves with changes of the society. Adapting to such changes, IEH collaborates closely with other institutes, while increasing its faculty members and instrumentation. On the basis of health sciences, we are applying the state-of-the-art technology and management to prepare our students for the demands of industry and government, which will ensure the students have potential to plan and execute the work for environmental protection and sustainable development.

Faculty/student research presently concentrate on air pollution, water sanitation, bioaerosol, environmental toxicology, environmental epidemiology, environmental microbiology, industrial hygiene, physical environment and so on. Results are pre-

sented in relevant journals and conferences.

Looking into the future, IEH will integrate the modern administrative knowledge, life sciences, and environmental protection technology into conventional environmental health in order to continuously play an active role in education, research, and services in environmental health.

## FACULTY

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Full-time: 8

Part-time: 6

Ph.D. Degree: 14

### Director/ Professor

Gen-Shuh Wang Ph.D., State University of New York at Albany

### Full-time

#### Associate Professor

Yee-Chung Ma Ph.D., University of Delaware

Ching-Wen Chang Ph.D., University of Cincinnati

Shih-Wei Tsai Ph.D., University of California at Los Angeles

Chia-Yang Chen Ph.D., University of North Carolina at Chapel Hill

Chang-Fu Wu Ph.D., University of Washington

#### Assistant Professor

Ching-Yu Lin Ph.D., University of California, Davis

Sheng-Wei Wang Ph.D., Environmental Sciences, Rutgers University, New Jersey, U.S.A.

### Part-time

#### Professor

Jih-Ching Lien Ph.D. in Medical Sciences, Nagasaki University, Japan

Fung-Chang Sung Ph.D., University of Washington

Jia-Ming Lin Ph.D., University of Cincinnati

#### Associate Professor

Yi-Chang Lin Dr. P.H., University of Texas, Houston

Chiou-Jong Chen Ph.D., Kyoto University, Japan

Shih-Chun Lung Sc.D, Harvard University

## FACILITIES

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Our laboratories are located on the 9th and 10th floors of Public Health Building. The majority of the 9th floor is dedicated to P1 and P2 levels biological laboratories. The 10th floor is shared with OMIH. It currently contains the Environmental Chemistry Lab, the Air Pollution and Health Effects Lab, the Environmental Microbiology Lab, and the Environmental Exposure Assessment Lab. In addition, there are the organic and inorganic chemistry core facilities equipped with analytical instruments, the balance room, the CO<sub>2</sub> incubator room, the refrigeration room, and water distillation and de-ionization facilities. There is also a common laboratory space for general chemistry experiments and sample pretreatments. Most instruments in the labs are for taking measurements of toxins, bioaerosols, and the working environments include GC, IC, GC/MS, LC/MS, AAS, HPLC, ICP and PCR.

The Medical Library in the College of Medicine supplies essential reference materials.

## COURSES

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### Master Degree

Candidates for MSPH in Environmental Health must complete courses that provide 24 credits of fundamental knowledge in environmental health in addition to the six-credit thesis. The required courses are: Applied Biostatistics (3), Environmental and Occupational Toxicology (2), and three of the following: Risk Assessment for Environmental Health (2), Environmental and Occupational Epidemiology (2), Environmental Measurement and Analysis (2), Environmental Health (2), Environmental Health Policy (2).

### Ph.D. Degree

Candidates for Ph.D. degree in Environmental Health are required to take a minimum of 26 credits in addition to the 12-credit dissertation. Students with excellent academic achievements who have completed at least one year of master study can apply for Ph.D. Study. The core credits are: Seminar on Environmental Health (2), Seminar on Industrial Hygiene (2), Internship Consultation of Environmental Health (I) (1), Internship Consultation of Environmental Health (II)(1).

## ACADEMIC ACTIVITIES

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1. Weekly seminar
2. Invite savants from other institutions for student seminar hours monthly
3. Encourage faculty and students to join academic associations and attend international conferences
4. Collaborate with other institutions in the medical campus to achieve academic excellence in teaching and research
5. Share academic resources with governmental agencies of environmental protection, health, as well as industrial hygiene.



## CONTACT INFORMATION

---

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# 7. GRADUATE INSTITUTE OF PREVENTIVE MEDICINE

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## INTRODUCTION

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Since 1961, the Division of Preventive Medicine, Institute of Public Health (IPH), has offered MS programs. When the Institute of Epidemiology was established in 1994, the institute took over the responsibility of teaching and research of the Division of Preventive Medicine from IPH. The Institute of Preventive Medicine was established in 2001 after 3 years preparation. In addition, The Ph.D. Program of the Institute of Preventive Medicine was launched since 2005. Currently, the Institute of Preventive Medicine offers both MS and Ph.D. programs for its students.

## FACULTY

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Professor: 7 including 5 with joint appointment with other Departments,

Associate Professors: 3, including 2 with joint appointment with other Department

Assistant Professor : 2

Part-time Professors: 1

Part-time Associate Professors: 2

Part-time Assistant Professors: 4

### Director/Professor

Wei J. Chen                      Sc.D, Harvard University,  
USA

### Full-time

#### Professor

Mei-Shu Lai                      M.D. and Ph.D., NTU

Wei-Chu Chie                      M.D. and Ph.D., NTU

#### Associate Professor

Kuo-Liong Chien                      M.D. and Ph.D., NTU

#### Assistant Professor

Yen-Ching Karen Chen  
Sc.D, Harvard University,  
U.S.A.

Yung-Ling Leo Lee                      M.D. and Ph.D., NCKU

### Adjunct

#### Professor

Wei J. Chen                      Sc.D, Harvard University,  
USA

Keh-Sung Tsai                      M.D. and Ph.D., NTU

Li-Min Chuang                      M.D. and Ph.D., NTU

Li-Min Huang                      M.D. and Ph.D., NTU

Chuen-Den Tseng                      M.D. and Ph.D., NTU

#### Associate Professor

Chao-Wen Weng                      M.D. and Ph.D., NTU

Hui-Ming Ma                      Ph.D., Johns Hopkins Uni-  
versity, USA



## Part-time

### Professor

Hung-Chang Sung Ph.D., Washington  
University, U.S.A.

### Associate Professor

Shiing-Jer Twu Ph.D., University of  
California at Los Angeles,  
U.S.A.

Long-Teng Lee M.D. and Ph.D., NTU

### Assistant Professor

Ming-Neng Shiu M.D. and Ph.D., NTU

Yen-Po Yeh M.D. and Ph.D., NTU

Li-Chen Hsieh M.D. and Ph.D., NTU

Wen-An Lai M.D. and Ph.D., NTU

## FACILITIES

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Besides periodicals, books, and internet resources possessed by the library of the College of Medicine the Institute of Preventive Medicine has a total of 1200 volumes consisting of a variety of periodicals, books, and reports whereby students and teachers can be provided with updated and professional information.

## COURSES

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The mission of the Institute of Preventive Medicine is to promote the health and well-being of individuals and communities through excellence in research, teaching and community service. The Institute seeks support for research in priority areas using interdisciplinary integration including epidemiology, biostatistics, health economic evaluation, decision-making, health promotion, and health care management. The Institute integrates these disciplines into evidence-based preventive medicine that enables the Institute to implement disease prevention and to translate scientific advances to community-based programs for prevention of disease morbidity, mortality and disability. The program focuses as on the following areas:

1. Prevention of chronic diseases such as coronary heart disease, diabetes, obesity and strokes through life style factor internation.
2. Prevention of cancer through screening and evaluation of screening.
3. Promotion of mental health in the community through health education and screening.
4. Surveillance and control of re-emerging or new infectious diseases.
5. Promote maternal and child health through reduction of premature births and prevention of prenatal morbidity and mortality, adequate nutritional intakes by mothers and infants, childhood injury control and prevention of

disability.

6. Formulate health policy for prevention and management of cancer and chronic diseases.

The Institute offers the following courses: Introduction to Preventive Medicine, Case Studies in Preventive Medicine, Statistics in Preventive Medicine, Practice of Statistics in Preventive Medicine, Seminar on Preventive Medicine Methods, Seminar on Preventive Medicine Practice, Advanced Principles of Preventive Medicine, Research Method in Preventive Medicine I and II.

## REQUIRED COURSES

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### Doctor Degree

- Advanced Methods in Epidemiology (2)
- Advanced Theory of Preventive Medicine I (2)
- Advanced Theory of Preventive Medicine II (2)
- Advanced Seminar on Preventive Medicine Methods I (1)
- Advanced Seminar on Preventive Medicine Methods II (1)
- Advanced Seminar on Preventive Medicine Methods III (1)
- Advanced Seminar on Preventive Medicine Methods VI (1)

### Master Degree

- Applied Biostatistics (3)
- Introduction to Preventive Medicine (2)
- Seminar on Preventive Medicine Methods (2)
- Seminar on Practice of Preventive Medicine (2)
- Study Design of Preventive Medicine I (2)
- Clinical Practice in Preventive Medicine (2)
- Thesis Writing on Preventive Medicine (2)
- Principles of Epidemiology (2)

## ACADEMIC ACTIVITIES

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The research activities are based on population-based studies. The Institute builds upon established population laboratories for new research programs, especially those that require long-term follow up. Seminars are conducted weekly or monthly to enhance disseminations of new research findings, to generate new research concepts and to enhance communications within the medical communities, and interactions between students and faculty members as well as colleagues in the community. Teaching is conducted both in classroom settings and in the field. Small group discussions are held regularly with students assigned to field studies.

## CONTACT INFORMATION

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Established in: 2001

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# 8. MASTER OF PUBLIC HEALTH PROGRAM

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## INTRODUCTION

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Since the initiation of the National Health Insurance by the government in 1995 and the SARS outbreak in 2003, the need for public health professionals has been rapidly increasing. Besides, due to the rapid social and economic development, the government needs more professionals of environment and occupation health. Therefore, the health units, hospitals and related organizations require on-job training of their employees. In the past, these professionals were sent to the United States to get the degree of Master of Public Health (MPH) by a cooperative project between Taiwan government and the College of Public Health of Johns Hopkins and Tulane Universities. Being concerned that foreign experiences cannot fulfill local needs, the College of Public Health in Taiwan University decided to start the Program of MPH to equip local manpower with practical experiences and cultivate future professional human resources for the society.

The MPH program was established in October in 2007 and was the first master degree “program” in Taiwan. This program is different with other master degrees provided by regular departments or graduate institutes such as Master of Science (M.S.) which emphasize development of masters for academic research. On the contrary, the characteristics of this program are to integrate resources in the college, combine theory and practice, and cultivate scientific evidences and strategic thinking of public health professionals.

At first, we planned three mutually related fields, including Community Health Scientific Field, Environmental and Occupational Health Field and Health Policy and Management Field. However, the size of student body is limited to 15 according to the policy of the Ministry of Education. Therefore, only Community Health Scientific Field and Health System Management Field started to recruit student in first year. Environmental and Occupational Health Fields will be suitable for recruit students in the near future.

## FACULTY

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The faculties of the MPH are supported by the all Institutes of the College of Public Health. The students of the Community Health Scientific Field are directed by the faculties of Institute of Preventive Medicine, and the students of the Health System Management Field are directed by the faculties of Institute of Health Policy and Management.

## COURSES

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The program offers a Master's Degree, which has a maximum of six year. The minimal number of credits required is 42. The curriculum designed for the program consists of basic core courses, the correlation required courses, elective courses and practicum course. After finishing the basic core courses, the student will have 200 hours practicum curricula. The program office coordinates the relevant Institutes to deliver the courses for the students every school year.

## FUTURE PERSPECTIVES

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The vision of the MPH is to establish the outstanding human resources which a healthy country needs. According to the reality social environment and the professional characteristic stockpile a security, fair, effective, and qualified medical health system. The affiliation by the college of public health and the medical college in the past and the future that remarkable teaching and the research, combination of theory and the service, under multi-social environment, will raise student's scientific evidence and the strategy. Furthermore, the combination of the public health practice and research to provide the students and the faculties advanced the knowledge, and a deep understanding of the overall cost, quality and equity of the national health care system.

## CONTACT INFORMATION

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# IX. COLLEGE OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE



## Academic Units

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- Electrical Engineering
- Computer Science & Information Engineering
- Photonics & Optoelectronics
- Communication Engineering
- Electronics Engineering
- Networking & Multimedia
- Biomedical Electronics & Bioinformatics
- Communication Research Center

## The Present & Former Deans

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Powen Hsu (1997-2003)      Soo-Chang Pei (2003-2009)      Lin-Shan Lee (2009-present)



## HISTORY

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The history of the College dates back to August 1997 when the College of Electrical Engineering, the ninth college within National Taiwan University, was formed from three existing institutes which spun off from the College of Engineering: the Department and Graduate Institute of Electrical Engineering, the Graduate Institute of Photonics and Optoelectronics, and the Communication Research Center, and one new institute, the Graduate Institute of Communication Engineering. In August 2000 the College was renamed the "College of Electrical Engineering and Computer Science" when the Department and Graduate Institute of Computer Science & Information Engineering was merged into the College, again spinning off from the College of Engineering. The Graduate Institute of Electronics Engineering and the Graduate Institute of Networking and Multimedia were established in August 2001 and 2004, respectively. In August 2006, the new Graduate Institute of Biomedical Electronics and Bioinformatics was established. At present, with its two departments and seven graduate institutes, the College employs about 213 full-time and adjunct faculty members, and has an enrollment of almost 1,418 undergraduate students, and about 2,508 M.S. and Ph.D. students.

The Department of Electrical Engineering was founded in 1945 when Taiwan was returned to the Republic of China after the Japanese occupation and Taihoku Imperial University was renamed National Taiwan University. The Graduate Institute of Electrical Engineering was established in 1947 with an M.S. degree program, and it started to offer programs of study leading to a Ph.D. degree in 1968. The Department of Computer Science & Information Engineering was founded in 1977 and the Graduate Institute of CSIE was later established in 1981, starting its M.S. and Ph.D. degree programs in 1981 and 1984, respectively. In 1992, the Electro-Optics Group of the EE Graduate Institute was made administratively independent to become the Graduate Institute of Photonics and Optoelectronics, offering an M.S. degree program. Its Ph.D. degree program started three years later. Also in 1992, the Communication Research Center was established in accordance with the national policy of communication technology development. Since then, industry related to electrical engineering in Taiwan has made a tremendous contribution to both the technological development and the economic growth of the country. The need for EE personnel has continuously increased. In order to provide our society with EE education and curriculum of a high standard and hence to fulfill the human resource need in industry, guided by the planning of Professor Powen Hsu, the EE Department and the above related institutes were grouped with the newly established Graduate Institute of Communication Engineering, which was formed

from the Electromagnetic Wave Group and the Communication and Signal Processing Group within the EE Graduate Institute, to establish the College of Electrical Engineering. It was then enlarged to become the College of EECS, with the Department and Graduate Institute of CSIE becoming new members. With its outstanding performance in both research and education, the College of EECS has become one of the most important organizations responsible for the country's continuous advances in EECS-related high technology. The Graduate Institute of Electronics Engineering, was founded in August 2001, offering M.S. and Ph.D. degree programs, and was based on the existing faculty and facilities of the Solid State Electronics Group and the Integrated Circuits and Systems Group within the EE Graduate Institute. The Institute is expected to make great contributions to promoting further advances in the country's electronic technology industry. The Graduate Institute of Networking and Multimedia was founded in August 2004, offering M.S. and Ph.D. degree programs. The College's newest institute, the Graduate Institute of Biomedical Electronics and Bioinformatics was founded in August 2006. Starting August 1st, 2007, the Graduate Institute of Electro-Optical Engineering had changed its name into the Graduate Institute of Photonics and Optoelectronics.

## FACILITIES

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All the departments and institutes continuously enlarge and improve the facilities for teaching, including the library collections, laboratory equipment, computers, and networks, in order to provide a satisfactory environment for teaching and learning. The College has five buildings for research and teaching, the Electrical Engineering Building I, the Electrical Engineering Building II, Barry Lam Hall, the CSIE Building, and Ming-Da Hall, with a total floor space of about 53,500 square meters.

## RESEARCH

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The research work conducted in this College is extremely productive. There are 174 full-time faculty members and about 2,508 M.S. and Ph.D. students. Over 450 research projects are conducted every year, with an annual budget exceeding 24 million US dollars. Two key projects sponsored by the Ministry of Education are currently in progress: Program for Promoting Academic Excellence of University (Phase II) and Aim for Top University Project. Under the latter, the NTU Center for Information and Electronics Technologies has recently been established. The number of original research articles published in international prestigious journals such as IEEE transactions or SCI journals is over 500 every year. The faculty members have been elected as Fellows by prestigious interna-

tional institutes such as IEEE and the Optical Society of America (OSA), demonstrating the recognition by international communities of this College's research achievement. Thus, the College of EECS has become one of the most important organizations responsible for the country's continuous development in EECS-related high technology.

## GOALS

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The College aims toward the promotion of economic growth of this country through advanced applied research and development and the training of high-technology personnel. Academic fields of interest include: communication and signal processing, automatic control, computer science, power / power electronics, nano-electronics, integrated circuits & systems, electromagnetic waves, photonics and optoelectronics, biomedical engineering, and electronic design automation for the EE division, and computer architecture, computer systems, artificial intelligence, distributed computing, computer networking, multimedia systems, natural language processing, parallel computing, intelligent robotics and automation, financial computing, scientific computing, and automated reasoning for the CS division. This broad spectrum in research makes the College the most complete EECS organization nationwide and offers deep as well as broad education and training for the students.

The EECS alumni, in addition to having excellent achievements in academic research both internationally and domestically, have made outstanding contributions in leading the rapid and successful advanced technological industry growth in Taiwan, in promoting the economic development of this country, and even in advancing the nation's higher education. Members of the College have been working hard with the goal of keeping up with international progress in both industrial and academic fields. The College also has a well-organized long-term plan of facility improvement, in order to better train outstanding scholars and to define research directions. It is to be expected that with such continuous progress, the College of EECS will turn itself into one of the most competitive research organizations in the world.

## CONTACT INFORMATION

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E-mail: [college@cc.ee.ntu.edu.tw](mailto:college@cc.ee.ntu.edu.tw)



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# 1. DEPARTMENT OF ELECTRICAL ENGINEERING

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## INTRODUCTION

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The Department of Electrical Engineering was founded in 1945. The Graduate Institute of Electrical Engineering was established in 1947 with a Master degree program, and the Ph.D. degree program was inaugurated in 1968. The Graduate Institutes of Electro-Optical Engineering, Communication Engineering, Electronics Engineering, and Biomedical Electronics and Bioinformatics were founded in 1992, 1997, 2001, and 2006 respectively. The Department and the Graduate Institutes together form the Electrical Engineering Division and are in the College of Electrical Engineering and Computer Science.

The Electrical Engineering Division at NTU has ten research groups: Automatic Control, Power/Power Electronics Engineering, Computer Science, Biomedical Engineering, Photonic and Optoelectronics, Electromagnetic Waves, Communications and Signal Processing, Nano-Electronics, Integrated Circuits and Systems, and Electronic Design Automatic. The Photonic and Optoelectronics group is in the Graduate Institute of Photonic and Optoelectronics Engineering. The Electromagnetic Waves, Communications and Signal Processing research groups belong to the

Graduate Institute of Communication Engineering. The Nano-Electronics and Integrated Circuit and Systems, and Electronic Design Automatic research groups are in the Graduate Institute of Electronics Engineering.

The Electrical Engineering Division at NTU has four Buildings: EE building I, EE building II, Barry Lam Hall and Ming-Da Hall . EE building I was constructed in 1969 and has about 2000 square meters. Currently it is mainly used as teaching laboratories for undergraduate students. The administration office of the Department, the faculty offices, and the research laboratories are mostly located in EE building II, which has a space of about 16,000 square meters. This building has classrooms, conference rooms, and several rooms for lectures, instruction, or discussion. Barry Lam Hall was donated by Barry Lam, and has a space of about 12,000 square meters. Ming-Da Hall was donated by K.Y. Lee, and has a space of about 13,000 square meters. The two building are mainly for teaching, research and holding academic seminars and workshops.

Electrical Engineering at NTU employs about 127 full-time and 14 adjunct faculty members. Among these faculty members, twenty-two have been pro-

moted to IEEE Fellow, three have been promoted to OSA Fellow, eight have won the Award for Distinguished Academic Contribution in Engineering sponsored by the Ministry of Education, R.O.C., five are the recipients of the Ten Outstanding Young Men Award of the Republic of China, one is the recipient of the Ten Outstanding Young Women Award of the Republic of China.

The Department, through its Course Planning Committee, has developed a strong curriculum providing students with broad basic knowledge on which a solid career in Electrical Engineering can be built. In addition, the committee also reviews and revises this curriculum regularly to reflect the changing needs of industry and society.

The Department of Electrical Engineering offers an undergraduate program preparing the students for a career in various fields of electrical engineering as well as for advanced study. The undergraduate students can freely select their studies in any field based on their interests.

The Graduate Institutes offer graduate programs, leading to the degrees of master of science (M.S.) and doctor of philosophy (Ph.D), and aiming to prepare the students especially for a career in teaching and/or research. The graduate students are admitted in one of the ten fields to do their research.

The members of Electrical Engineering at NTU commit themselves to maintaining a leading role in

different areas in industry and in academia, and Electrical Engineering at NTU has made its long-term planning in recruiting faculty members, strengthening facilities and budget, and defining research directions. The main objective is to promote it gradually to become an internationally recognized institution of applied science and advanced technology.

The long-term strategic plan of the department is to offer complete research environment for the research needs of all the graduate institutes in Electrical Engineering Division. With this [one-undergraduate-program-multiple-graduate-institute] structure, the Department of Electrical Engineering in National Taiwan University endeavors to cultivate more capable human resources for society and to achieve research excellence and recognition among international academic community.



## FACULTY

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Full-time: 127

Part-time: 14

Ph.D. Degree: 140

B.S. Degree: 1

### Chair/ Professor

Jenn-Gwo Hwu Ph.D., NTU

### Full-Time

#### Professor

Soo-Chang Pei Ph.D., Univ. of California

Lin-Shan Lee Ph.D., Stanford Univ.

Way-Seen Wang Ph.D., Univ. of Southern  
California

Jing-Shown Wu Ph.D., Cornell Univ.

Si-Chen Lee Ph.D., Stanford Univ.

Yuan-Yih Hsu Ph.D., NTU

Wei-Song Lin Ph.D., NTU

Hsueh-Jyh Li Ph.D., Univ. of Pennsylvania

Hung-Chun Chang Ph.D., Stanford Univ.

Powen Hsu Ph.D., Univ. of Southern  
California

Shyh-Kang Jeng Ph.D., NTU

Ju-Hong Lee Ph.D., Rensselaer Polytechnic

Tah-Hsiung Chu Ph.D., Univ. of Pennsylvania.

Hen-Wai Tsao Ph.D., NTU.

Ruey-Beei Wu Ph.D., NTU

Fan-Ren Chang Ph.D., Univ. of Houston

James B. Kuo Ph.D., Stanford Univ.

Yean-Woei Kiang Ph.D., NTU

Sheng-De Wang Ph.D., NTU

Li-Chen Fu Ph.D., Univ. of California,  
Berkeley

Hsu-Chun Yen Ph.D., Univ. of Texas

Hao-Hsiung Lin Ph.D., NTU

Liang-Gee Chen Ph.D., National  
Cheng-Kung Univ.

I-Kong Fong Ph.D., NTU

Mao-Chao Lin Ph.D., Univ. of Hawaii

Sy-Yen Kuo Ph.D., Univ. of Illinois at  
Urbana-Champaign, USA

Chih-Chung Yang Ph.D., Univ. of Illinois,  
Urbana-Champaign

Fei-Pei Lai Ph.D., Univ. of Illinois,  
Urbana-Champaign

Shi-Chung Chang Ph.D., Univ. of Connecticut

Tzi-Dar Chiueh Ph.D., California Institute of  
Technology

Chern-Lin Chen Ph.D., NTU

Shey-Shi Lu Ph.D., Univ. of Minnesota.

Ying-Jay Yang Ph.D., Univ. of North  
Carolina

Sao-Jie Chen Ph.D., Univ. of Southern  
Methodist

Chin-Laung Lei Ph.D., Univ. of Texas

Zse-Hong Tsai Ph.D., Univ. of California,  
Los Angeles

Ming-Syan Chen Ph.D., Univ. of Michigan,  
Ann Arbor

Huei Wang Ph.D., Michigan State Univ.

Kwang-Cheng Chen Ph.D., Univ. of Maryland

Ching-Fuh Lin Ph.D., Cornell Univ.

Chorng-Kuang Wang Ph.D., Univ. of California,  
Berkeley

Shen-Iuan Liu Ph.D., NTU



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Yung-Yaw Chen	Ph.D., Univ. of California, Berkeley	Chii-Wann Lin	Ph.D., Case Western Reserve Univ.
Lon A. Wang	Ph.D., Univ. of Arizona.	Chung-Chi Wu	Ph.D., Princeton Univ.
Jean-Fu Kiang	Ph.D., Massachusetts Inst. of Technology	Tzong-Lin Wu	PH.D., NTU
Jhy-Horng Chen	Ph.D., Univ. of California, Berkeley	Gong-Ru Lin	Ph.D., National Chao-Tung Univ.
Chee-Wee Liu	Ph.D., Princeton Univ.	Chen-En KO	PH.D., Univ of Southern California
Chieh-Hsiung Kuan	Ph.D., Princeton Univ.	Tian-Wei Huang	Ph.D., UCLA
Chih-Wen Liu	Ph.D., Cornell Univ.	Reng-C. Luo	Ph.D., Technical Univ. of Berlin, Germany
Chi-Kuang Sun	Ph.D., Harvard Univ.	Chung-Ping Chen	Ph.D., Univ. of Texas at Austin
Lung-Han Peng	Ph.D., Harvard Univ.	Yao-Yu Chuang	Ph.D., Harvard Univ.
Pai-Chi Li	Ph.D., Univ. of Michigan	Liang-Hung Lu	Ph.D., Univ. of Michigan
Zhe-Chuan Feng	Ph.D., Univ. of Pittsburgh, USA.		
Dan Chen	Ph.D., Duke Univ.	<b>Associate Professor</b>	
Ching-Kuang Tzuang	Ph.D., Univ of Texas, Austin	Fok-Ching Chong	B.S., NTU
Homer H. Chen	Ph.D., Univ. of Illinois at Urbana-Champaign	Jen-Ho Tsao	Ph.D., Univ. of Pennsylvania
Hsiao-Wen Chung	Ph.D., Univ. of Pennsylvania	Tsung-Nan Lin	Ph.D., Princeton Univ.
Yao-Wen Chang	Ph.D., Univ. of Texas, Austin	Ming-Hua Mao	Ph.D., Technical Univ. of Berlin, Germany.
Wan-Jiun Liao	Ph.D., Univ. of Southern California	Hong-Yan Lin	Ph.D., NTU
An-Yeu Wu	Ph.D., Univ. of Maryland	Hsuan-Jung Su	Ph.D., Univ. of Maryland
Farn Wang	Ph.D., Univ. of Texas at Austin	Da-Shan Shiu	Ph.D., Univ. of California, Berkeley
Char-Dir Chung	Ph.D., Univ of Southern California	Tai-Cheng Lee	Ph.D., Univ. of California, Berkeley
Sheng-Lung Huang	Ph.D., Univ. of Maryland.	Chien-Mo Li	Ph.D., Stanford Univ.
See-May Phoong	Ph.D., California Institute of Technology	Polly Huang	Ph.D., Univ. of Southern California
		Jiun-Haw Lee	Ph.D., NTU
		Chih-I Wu	Ph.D., Princeton Univ.
		Jian-Jang Huang	Ph.D., Univ. of Illinois

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Jiun-Lang Huang	Ph.D., Univ. of California, Santa Barbara	Yu-Hsuan Kuo	Ph.D., Stanford Univ.
Feng-Li Lian	Ph.D., Univ. of Michigan	I-Chun Cheng	Ph.D., Princeton Univ.
Yi-Cheng Lin	Ph.D., Univ. of Michigan	Jr-Hau He	Ph.D., National Tsing Hua Univ.
Tsung-Hsien Lin	Ph.D., UCLA	Yuh-Renn Wu	Ph.D., Univ. of Michigan
Jri Lee	Ph.D., UCLA	Tian-Li Yu	Ph.D., Univ. of Illinois, Urbana-Champaign
Yaow-Ming Chen	Ph.D., University of Missouri	Chen-Mou Cheng	Ph.D., Harvard Univ.
Yi-Jan Chen	Ph.D., Georgia Institute of Technology	Chun-Ting Chou	Ph.D., Univ. of Michigan
Guo-Dung Su	Ph.D., UCLA	Po-Ling Kuo	Ph.D., Harvard Univ.
Shao-Yi Chien	Ph.D., NTU	Tian-Wei Cheng	Ph.D., Univ. of Michigan
Hung-Yun Hsieh	Ph.D., Georgia Institute of Technology	Borching Su	Ph.D., California Institute of Technology

**Assistant Professor**

Yih-Peng Chiou	Ph.D., NTU
Hsin-Chia Lu	Ph.D., NTU
Hsin-Shu Chen	Ph.D., Univ. of Illinois
Chung-Yang Huang	Ph.D., Univ. of California, Santa Barbara
Wing-Kit Choi	Ph.D., Univ. of Cambridge
Ding-Wei Huang	Ph.D., NTU
Kuen-Yu Tsai	Ph.D., Stanford Univ.
Jui-Che Tsai	Ph.D., UCLA
Jie-Hong Jiang	Ph.D., Univ. of California, Berkeley
Hung-Yu Wei	Ph.D., Univ. of Columbia
Ping-Cheng Yeh	Ph.D., Univ. of Michigan
Kun-You Lin	Ph.D., NTU
Kung-Bin Sung	Ph.D., Univ. of Texas
Shih-Yuan Chen	Ph.D., NTU
Jian-Jiun Ding	Ph.D., NTU
Chih-Ting Lin	Ph.D., Univ. of Michigan

**Part-Time****Adjunct Professor**

H.C. Meng	Ph.D., Ruhr Univ., Ger- many.
S.J. Yong	Ph.D., Univ. of Michigan
W.S. Feng	Ph.D., NTU
W.K. Wang	Ph.D., Johns Hopkins Univ.
J.F. Chang	Ph.D., Univ. of California, Berkeley
T.S. Kuo	Ph.D., Georgia Institute of Technology
C.M. Chen	Ph.D., Univ. of Maryland
T.B. Lin	Ph.D., NTU

**Adjunct Associate Professor**

Richard M. Hong,	Ph.D., Univ. of Michigan.
T.C. Shih	Ph.D., Grenoble Univ., France.
C.Y. Wu	Ph.D., National Tsing-Hua Univ.

M.C. Tsai                      Ph.D., Univ. of California,  
Berkeley.

**Adjunct Assistant Professor**

Y.M. Tsai                      Ph.D., NTU

L.H. Yeh                        Ph.D., Univ. of California,  
Berkeley.

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## FACILITIES

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The department is currently housed in four buildings with a total floor space of about 35,000 square meters. There are 12 undergraduate laboratories, more than 150 graduate research laboratories, more than 19 classrooms, 210 faculty offices, more than 30 meeting rooms, and 28 administrative offices. Computing facilities include more than one thousand personal computers and workstations, which are connected to the supercomputers of the campus computer center through high-speed optical networks. Other major laboratories include Integrated Optics Laboratory, Anechoic Chamber Laboratory, Integrated Circuits Laboratory, Molecular Beam Epitaxy Laboratory, Magnetic Resonance Imaging Laboratory, and E-beam Laboratory.

Major teaching laboratory facilities in the Department of Electrical Engineering for the undergraduate curriculum include:

Electrical Circuits Laboratory, Electrical Electronics Laboratory, Electrical Machinery Laboratory, Digital Electronics Laboratory, Electromagnetic Wave Laboratory, Semiconductor Laboratory,

Communications Laboratory, Automatic Control Laboratory, Opto-electronics Laboratory, Networks and Multimedia Laboratory, Embedded System Laboratory, and Biomedical Engineering Laboratory.

In addition, there are more than 130 research laboratories in the department to support research projects and graduate study. Herewith only laboratories associated with the Automatic Control group the Power / Power Electronics Engineering group and the Computer Science group, are listed. Detailed information about other laboratories can be found in the sections introducing the other graduate institutes.

### Automatic Control

Intelligent and Precision Motion Control Laboratory, Advanced Control Research Laboratory, Advanced Sensing and Computer Control Laboratory, and Control and Decision Laboratory, Networked Control Systems Laboratory.

### Power/ Power Electronics Engineering

Electrical Power Research Laboratory, Power Delivery Automation Research Laboratory, and Power Electronics Research Laboratory.

### Computer Sciences

Microprocessor Research Laboratory, Computer System Research Laboratory, Distributed System Laboratory, Networks Security Laboratory, Networks Database Laboratory, Networks and Multimedia Research Laboratory, Supercomputer

Research Laboratory, and Department Computer Center.

## COURSES

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The department, with the help of its course planning committee, has developed a strong curriculum providing students with broad basic knowledge on which a solid career in Electrical Engineering can be built. In addition, the committee also reviews and revises this curriculum regularly to reflect the changing needs of industry and society.

### Undergraduate Programs

The undergraduate program includes required courses in basic sciences and humanities as well as basic courses in electrical and computer engineering:

Freshman Year: Calculus I & II, Physics I & II, Physics Laboratory I & II, Chemistry and Laboratory / Introduction of Biological Science, Computer Programming, Introduction to Computer, Linear Algebra. Sophomore Year: Electric Circuits, Electronics I & II, Electromagnetics I, Signal and Systems, Differential Equation, Probability and Statistics, Complex Variables or Discrete Mathematics, Switching Circuits and Logic Design, Electronic Circuits Laboratory I & II.

Junior Year: Electronics III, Electromagnetics II, Electronic Circuits Laboratory III.

Required Electives in Junior and Senior years are further divided in two categories: Applied Sciences: Modern Physics, Fundamentals of Electro-Optics, Solid-State Electronics, Electromagnetic Wave Engineering, Introduction to Biomedical Engineering, RF Microwave Wireless Systems.

Systems: Principles of Communications, Data Structures and Program Design. Introduction to Electronic Design Automation Introduction to Power Engineering, Control Systems, Integrated Circuits Design, Introduction to Electronic Design Automation.

Two out of the following ten laboratory courses are also required: Electric Machinery Laboratory, Automatic Control Laboratory, Digital Circuits Laboratory, Electromagnetic Wave Laboratory, Semiconductor Laboratory, Communications Laboratory, Networks and Multimedia Laboratory, and Embedded System Laboratory, Biomedical Engineering Laboratory, and Opto-electronics Laboratory.

### Graduate Programs

The graduate program of the department consists of three major areas: Automatic Control, Power / Power Engineering, and Computer Science. The programs in other areas are provided by the Graduate Institute of Photonics and Optoelectronics Engineering (established in 1992), the Graduate Institute of Communication Engineering (estab-

lished in 1997), the Graduate Institute of Electronics Engineering (established in 2001), and the Graduate Institute of Biomedical Electronics and Bioinformatics (established in 2006). The program leading to the Master of Science in Electrical Engineering requires a course work of 24 credits, excluding Seminar, Special Projects, Department Colloquium, and Thesis. The thesis must be presented to and approved by a committee in less than four academic years.

The program leading to the Doctor of Philosophy in Electrical Engineering requires course work of at least 18 credits and the following qualifications: (1) passing the Ph. D. candidacy qualification examination within the first four academic semesters, and, (2) pass the dissertation proposal and credit review and (3) presentation of a dissertation approved by a committee. First-year students with distinguished qualification in the M.S. program or students with a B.S. degree can apply to enter the Ph.D. program without a M.S. degree. In this case, the course work requirement is 42 credits.

## ACADEMIC ACTIVITIES

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Regular lectures as well as seminars are held every week for effective exchange of research experience. In addition, workshops, academic symposia, and international conferences are organized by the Department or the Graduate Institutes to invite outstanding international scholars and experts to present their scientific studies.

In the 2007, department faculty conducted more than 300 projects. These projects were sponsored by the National Science Council, Ministry of Education, Ministry of Economic Affairs, Defense Technology Coordination Agency, Chung-Shan Institute of Science and Technology, Chung-Hwa Tele-communication, Industrial Technology Research Institute, United Microelectronics Corp., Taiwan Semiconductor Manufacturing Corp., etc.. The yearly project budgets sum up to more than N.T. 600 million.

More than 417 of those are published in SCI journals and around 135 of those in IEEE/IEE journals in 2008.

## CAREERS AND FUTURE STUDIES

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### ■ Professional abilities

- (1) Automatic Control
- (2) Power/Power Electronics Engineering
- (3) Computer Science
- (4) Biomedical Engineering
- (5) Electro-Optics
- (6) Electromagnetic Waves
- (7) Communications and Signal Processing
- (8) Integrated Circuit and Systems
- (9) Nano-Electronics.
- (10) Electronic Design Automation

### ■ Future studies

Related research institutes in the areas of electrical engineering, electro-optical engineering, communications engineering, electronics engineering, and biomedical electronics engineering.

### ■ Career options

Electrical engineer, Electronics engineer, Computer scientist, Computer engineer, Researcher, etc.

## CONTACT INFORMATION

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## 2. DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING

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### INTRODUCTION

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#### History

In 1977, Taiwan's Ministry of Education approved the establishment of the Department of Information Engineering and its undergraduate degree program in the College of Engineering, National Taiwan University. It also marked the first time the name information engineering was adopted by academic departments in Taiwan. The department's master degree program was established in 1981, and three years later its doctoral degree program was established. From 1984, a complete academic program of information engineering with both undergraduate and graduate studies has been in place.

In August 2000, the department partnered with the EE department to form the EECS College. Since then, the EECS College has become a center of excellence among Taiwan's research departments in electrical engineering and computer science. At present, the department admits about 110 undergraduate students, 159 master's students, 7 part-time master's students, and 36 Ph.D. students each year. The total student enrollment includes 478 undergraduate students, 286 master's students, and 135 doctoral students.

The undergraduate curriculum lays the foundation for advanced studies in computer science and information engineering. The master's curriculum prepares students for a future career as senior software engineers in research and development. The doctoral curriculum allows students to specialize in research areas of their interests and prepare them for a future career in academic or industrial research labs. The department currently employs 35 full-time faculty members and 12 part-time faculty members. Faculty members are dedicated to both research and teaching in order to provide students with the state-of-art education in computer science. In addition, most faculty members participate in joint research collaboration with both local and international industrial partners in developing new and practical technologies.

#### Visions

The computer industry has become one of the most important sectors in the global economy. Currently, it also ranks as Taiwan's No. 1 exporting industry. As the source of future computer industry's top talents, the department has worked aggressively in the following directions:

1.To meet Taiwan's demands for large numbers of information professionals in the twenty-first century, steps have been taken to increase the number of undergraduate students and graduate institutes.

(1)In 2000, an additional undergraduate class was added. The undergraduate program now has two classes with a total student body of approximately 100 per year.

(2)The newly established Graduate Institute of Networking and Multimedia?? starts admitting students in 2004.

(3)A new Graduate Institute of Biomedical Electronics and Bioinformatics is under planning.

2.To develop technologies of more immediate use the industry, the department collaborates closely with national and international corporations and participates in Industry-University Co-op Research projects. The department's involvement in the Industry-University Co-op Research represents the earliest and longest-running case of such research in Taiwan.

3.To raise its global academic standing and competitiveness, the department shall aggressively conduct exchanges with national and international academic institutions.

## FACULTY

Distinguished Research Chairs: 3

Full-time Professors: 43

Adjunct Professors: 12

Visiting Professors: 4

Those with Ph.D. Degree: 62

Those with M.S. Degree: 1

### Department Chairman

#### Professor

Yuh-Dauh Lyuu Ph.D., Harvard University

#### Distinguished Research Chairs

Der-Tsai Lee Ph.D., University of Illinois at Urbana-Champaign

Andrew C. C. Yao Ph.d., Harvard University

Wen-Hsiung Li Ph.D., Brown University

#### Full-time

#### Professors

Ruey-Feng Chang Ph.D., National Tsing Hua University

Kun-Mao Chao Ph.D., Pennsylvania State University

Gen-Huey Chen Ph.D., National Tsing Hua University

Hsin-Hsi Chen Ph.D., National Taiwan University

Wen-Chin Chen Ph.D., Brown University

Li-Chen Fu Ph.D., University of California, Berkeley

Chiou-Shann Fuh Ph.D., Harvard University

Jieh Hsiang Ph.D., University of Illinois at Urbana-Champaign

Jane Yung-jen Hsu Ph.D., Stanford University

Yi-Ping Hung	Ph.D., Brown University	Tzao-Lin Lee	Ph.D., Carnegie Mellon University
Cheng-Yan Kao	Ph.D., University of Wisconsin, Madison	Shih-Wei Liao	Ph.D., Stanford University
Tei-Wei Kuo	Ph.D., University of Texas at Austin	Ai-Chun Pang	Ph.D., National Chiao Tung University
Feipei Lai	Ph.D., University of Illinois, Urbana-Champaign	Chi-Sheng Shih	Ph.D., University of Illinois at Urbana-Champaign
Lin-Shan Lee	Ph.D., Stanford University	Yufeng Jane Tseng	Ph.D., University of Illinois at Chicago
Chih-Jen Lin	Ph.D., University of Michigan	Chia-Lin Yang	Ph.D., Duke University
Phone Lin	Ph.D., National Chiao Tung University	<b>Assistant Professors</b>	
Cheng-Yuan Liou	Ph.D., Massachusetts Institute of Technology	Pu-Jen Cheng	Ph.D., National Chiao Tung University
Pangfeng Liu	Ph.D., Yale University	Winston H. Hsu	Ph.D., Columbia University
Hsueh-I Lu	Ph.D., Brown University	Chih-Wen Hsueh	Ph.D., University of California, Irvine
Yuh-Dauh Lyuu	Ph.D., Harvard University	Shih-Hao Hung	Ph.D., University of Michigan
Ming Ouhyoung	Ph.D., University of North Carolina at Chapel Hill	Mong-kai Ku	Ph.D., University of California, Los Angeles (UCLA)
Yen-Jen Oyang	Ph.D., Stanford University	Ming-Sui Lee	Ph.D., University of Southern California
Ja-Ling Wu	Ph.D., Tatung Institute of Technology	Hsuan-Tien Lin	Ph.D., California Institute of Technology
<b>Associate Professors</b>		Shou-De Lin	Ph.D., University of Southern California
Bing-Yu Chen	Ph.D., University of Tokyo	Chieh-Chih Wang	Ph.D., Carnegie Mellon University
Chuen-Liang Chen	Ph.D., National Chiao Tung University	<b>Adjunct Professors</b>	
Cheng-Fu Chou	Ph.D., University of Maryland at College Park	<b>Professors</b>	
Hao-Hua Chu	Ph.D., University of Illinois at Urbana-Champaign	Kuo-Young Cheng	Ph.D., State University of New York, Stony Brook
Yung-Yu Chuang	Ph.D., University of Washington		

Ching-Chi Hsu	Ph.D., National Taiwan University
Tsan-Sheng Hsu	Ph.D., University of Texas at Austin
Wen-Lian Hsu	Ph.D., Cornell University
Chi-Ying Huang	Ph.D., Iowa State University
Jau-Hsiung Huang	Ph.D., University of California, Los Angeles
Share-Young Lee	Ph.D., National Taiwan University
I-Peng Lin	Ph.D., University of Illinois at Chicago
Ferng-Ching Lin	Ph.D., State University of New York at Buffalo
Mu-Shieung Liu	Ph.D., State University of New York at Stony Brooks
Hsiao-Kuang Wu	Ph.D., University of California, Los Angeles

#### **Associate Professors**

Wen-Ming Yan	M.S., National Taiwan University
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#### **Assistant Professor**

Tsung-Tso Kan	Ph.D., National Taiwan University
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#### **Visiting Professors**

##### **Professors**

Hsiao-Wuen Hon	Ph.D., Carnegie Mellon University
Feng-Hsiung Hsu	Ph.D., Carnegie Mellon University
Jane W.-S. Liu	Ph.D., M.I.T.
Wei-Ying Ma	Ph.D., University of California, Santa Barbara

## **FACILITIES**

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The whole 5-story building, including the basement, is equipped with indoor access points to support wireless access to the network. The department currently has four shared laboratories: the workstation laboratory, the PC laboratory, the logic laboratory, and the information system training program. There are also more than twenty laboratories supervised by individual professors. Please refer to the department's Web site for further information.

### **PC Laboratory**

Provides computing facilities for course needs. The lab offers more than 80 PCs equipped with the newest Pentium CPU. All PCs run Microsoft Windows, Linux and other software for course works. The lab has two projectors, a digital broadcast teaching system and a digital desk to help teaching. There are also many reference books for students to borrow. To sum up, PC Laboratory provides a comfortable and effective teaching environment, and is also the place for students to practice after class.

### **Workstation Laboratory**

The workstation laboratory is used for the department-wide services of mails, files, and Web services. Its list of hardware includes 9 Intel Dual Xeon IBM workstations and Pentium dual-CPU workstations. A variety of operating systems are supported: Sun Solaris, Debian Linux, and

FreeBSD. The workstation laboratory provides computing facilities needed by students from other departments within the university who take courses offered by the CSIE department.

### Information System Training Program.

The PC laboratory has 60 PCs. It provides computing facilities for students' course projects. The room is divided into two sections through a movable partition. Two sections can accommodate 40 and 20 students each. The moveable partition can be detached to create space for 60 students. The lab's hardware is composed mainly of newest Intel Pentium-powered PCs. For operating systems, both Linux and Microsoft Windows are available to meet students' programming needs in course works.

### Logic Laboratory

The logic laboratory provides facilities to support network and hardware experiments in courses such as Digital Circuits, Computer Networks, and Computer Systems. It has a diverse array of hardware resources such as wireless LAN cards, wireless access points, hubs, oscilloscopes, logic analyzers, PCs, digital scopes, power supplies, function generators, extension interface protectors, IC burners, FPGA prototype boards, microprocessor emulators, ROM emulators, hardware toolboxes, and so forth. The lab offers reference manuals, electronic design automation tools, C compilers and assemblers for various microprocessors. Students can use these equipments to practice hands-on experiences

such as implementing network operations and designing system hardware/software. The computers in the lab are connected to the university's Computer Network Center backbone for high-speed network services.

## COURSES

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The goal here is to promote independent thinking, analytical skills and creativity in preparation for the student's future professional career. Each undergraduate student is expected to complete 136 course credits in order to graduate. Among them, the required courses make up 78 credits, general-education non-departmental courses 18 credits, core-curriculum courses 12 credits, and elective courses 28 credits (among which at least 18 credits must be awarded by department-offered courses).

### Required Courses

The courses are divided into five main categories. The philosophy behind this structure is for freshman and sophomore courses to concentrate on the fundamental skills in computer science, and for junior and senior courses to focus on more advanced, specialized areas. They also offer various elective courses for students to pursue their fields of interests and to establish a research direction. The five categories are listed below.

### **Mathematical and Theoretical Foundations:**

Calculus (General Mathematics) (I)(II); General Physics (I)(II); Discrete Mathematics; Linear Algebra; Probability; Formal Languages and Automata Theory

### **Computer Fundamentals:**

Introduction to Computer Programming; Introduction to Computers; Principles of Information Systems; Object-Oriented Programming; Data Structures and Algorithms (I)(II)

### **Software Systems:**

Computer Organization and Assembly Languages; Systems Programming; Operating Systems; Compiler Design; Database Systems

### **Hardware Structures:**

Digital Electronics; Digital System Design; Digital Circuit Lab.; Computer Architecture

### **Computer Networks:**

Computer Networks

### **Graduate Courses**

Master's courses are geared towards providing necessary education and training needed for a successful senior software engineering career in technology development. Doctoral courses are designed to prepare students into thesis research in specialized research areas. The required credit counts for each program are listed below.

### **Minimum Credit Count Requirements for the Master's Program**

At least 24 credits for courses offered by the department (but excluding Master's thesis, seminar, and research courses). The credit count requirement is 24 for in-service Master's students (part of the Ministry of Education's Continuing Education initiative).

### **Minimum Credit Count Requirements for the Doctoral Program**

At least 18 credits for courses offered by the department. The credit count requirement is 30 for students who apply directly to the doctoral program (but excluding doctoral thesis, seminar, and research courses).

The graduate institute offers a wide selection of advanced elective courses for students to choose from according to their research areas of interests. Please refer to the department booklet for detailed information.

## **ACADEMIC ACTIVITIES**

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### **The Transnational Information Technology**

Educating world-class information professionals has always been on our top educational agenda. To demonstrate their capabilities, in recent years students have been encouraged to participate in research and development projects as well as in international contests. With the strong efforts of the students and the coaching faculty members, our students have competed in numerous national and international contests and repeatedly won top

prizes. Among the more representative international prizes are:

- 1997, fourth place in the ACM ICPC World Finals competition.
- 2000, second place in the IEEE First Annual Computer Society International Design Competition (CSIDC)
- 2001, fifth place in the IEEE Second Annual Computer Society International Design Competition (CSIDC).
- 2001, gold medal in Chinese Chess of the Sixth Computer Olympiad.
- 2002, gold medal in Chinese Chess of the Seventh Computer Olympiad.
- 2003, first place in the IEEE Fourth Annual Computer Society International Design Competition (CSIDC).
- 2004 ACM ICPC, Asia champion and sixth place in the world.
- 2008, first place in the ACM Data Mining and Knowledge Discovery competition.
- 2009, third place in the ACM Data Mining and Knowledge Discovery competition.
- 2009, fourteenth place in the ACM ICPC World Finals competition.
- 2009, RoboCup International Symposium, one of the top eight teams in the world.
- 2009, Microsoft Imagine Cup, first place in Asia and one of the top six teams in the world.
- 2009, gold medal in the Chinese Chess competition of the fourteenth Computer Olympiad.

It is a long-held department policy to assess its competitiveness based on the international standards. As a consequence, our students have been encouraged to compete internationally and pursue recognitions beyond the national boundary.



## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

- (1) computation theory
- (2) system software
- (3) data management
- (4) computer algorithms and Data Structure
- (5) computer hardware
- (6) communication and networking
- (7) multimedia

### ■ Further studies

- (1) computer science
- (2) computer network and multimedia
- (3) bio-informatics
- (4) electrical engineering
- (5) tele-communication
- (6) automatic control
- (7) applied mathematics
- (8) business management

### ■ Career options

Our graduates have a very broad range of job opportunity, including computer software design and management, research/development in computer networking, financial computing, IC designs, telecommunication, multimedia, office automation. Our graduates are also fully capable of performing excellent research, and have been an important part of global academic society.

We believe that as the computer industry advances rapidly, computers and digital information will revolutionize every aspect of our society and everyday lives. The graduates of our department will play many key roles in this global information trend, including academic researchers, R/D engineers in IT industry, system analysts, and so forth. As the most prestigious computer science department in Taiwan, we will work relentlessly towards our goal, and create great impacts on the information society that is yet to come.

## CONTACT INFORMATION

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Establishment: 1977

Chair: Yuh-Dauh Lyuu

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Email:[webmaster@csie.ntu.edu.tw](mailto:webmaster@csie.ntu.edu.tw)

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# 3. GRADUATE INSTITUTE OF PHOTONICS AND OPTOELECTRONICS

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## HISTORY

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The history of the Graduate Institute of Photonics and Optoelectronics (GIPO) at National Taiwan University dates back to 1987. It was then a Research Group of the Graduate Institute of Electrical Engineering. In August 1992, GIPO was established as part of the College of Engineering. Professor Hung-Chun Chang was the first Chairman. At the time, the Institute offered a Master's program. Three years later, in August 1995, the Institute started to offer its Ph.D. program. Since August 1997, the Institute has become part of the newly established College of Electrical Engineering. The College was renamed to the College of Electrical Engineering and Computer Science with the inclusion of the Department of Computer Science and Information Engineering. Professor Hen-Wai Tsao served as the second Chairman of the Institute from August 1998 through July 2001. From August 2001 to July 2007, Professor C. C. Yang served as the Chairman. Since August 2007, Professor Sheng-Lung Huang has been serving as the Chairman of the Institute.

## FACULTY

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Currently, there are 33 full-time faculty members and 1 adjunct professor in the Institute. The 33 faculty members include 18 professors, 7 associate professors, and 8 assistant professors.

### Chairman

Sheng-Lung Huang Ph.D., Univ. of Maryland, U.S.A.

### Professors

Jing-Shown Wu Ph.D., Cornell Univ., U.S.A.

Zhe-Chuan Feng Ph.D., Univ. of Pittsburgh, U.S.A.

Way-Seen Wang Ph.D., Univ. of Southern California, U.S.A.

Powen Hsu Ph.D., Univ. of Southern California, U.S.A.

Si-Chen Lee Ph.D., Stanford Univ., U.S.A.

Hen-Wai Tsao Ph.D., National Taiwan Univ., R.O.C.

Hung-chun Chang Ph.D., Stanford Univ., U.S.A.

C. C. (Chih-Chung) Yang  
Ph.D., Univ. of Illinois at Urbana-Champaign, U.S.A.

Yean-Woei Kiang	Ph.D., National Taiwan Univ., R.O.C.
Hao-Hsiung Lin	Ph.D., National Taiwan Univ., R.O.C.
Lon A. Wang	Ph.D., Univ. of Arizona, U.S.A.
Chih-Fu Lin	Ph.D., Cornell Univ., U.S.A.
Chee-Wee Liu	Ph.D., Princeton Univ., U.S.A.
Lung-Han Peng	Ph.D., Harvard Univ., U.S.A.
Chi-Kuang Sun	Ph. D., Harvard Univ., U.S.A.
Gong-Ru Lin	Ph.D., National Chiao Tung Univ., R.O.C.
Chung-Chih Wu	Ph.D., Princeton Univ., U.S.A.

**Associate Professors**

Hoang Yan Lin	Ph.D., National Taiwan Univ., R.O.C.
Ming-Hua Mao	Dr.-Ing., Technical Univ. of Berlin, Germany
Chih-I Wu	Ph.D., Princeton Univ., U.S.A.
Jiun-Haw Lee	Ph.D., National Taiwan Univ., R.O.C.
Jian-Jang Huang	Ph.D., Univ. of Illinois, Urbana-Champaign, U.S.A.
Guo-Dung Su	Ph.D., Univ. of California, Los Angeles, U.S.A.
Jui-Che (Ted) Tsai	Ph.D., Univ. of California, Los Angeles, U.S.A.

**Assistant Professors**

Yih-Peng Chiou	Ph.D., National Taiwan Univ., R.O.C.
Ding-Wei Huang	Ph.D., National Taiwan Univ., R.O.C.
Snow H. Tseng	Ph.D., Northwestern Univ., U.S.A.
Wing Kit Choi	Ph.D., Cambridge Univ., UK
Yun-Li (Charles) Li	Ph.D., Rensselaer Polytechnic Institute, U.S.A.
I-Chun Cheng	Ph.D., Princeton Univ., U.S.A.
Yuh-Renn Wu	Ph.D., Michigan Univ., Ann Arbor, U.S.A.
Jr Hau (JH) He	Ph.D., National Tsing Hua Univ., R.O.C.

**Adjunct Professors**

Chen-Shui Tsai	Ph.D., Stanford Univ., U.S.A.
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**Distinguished Chair Professors**

Chen-Shui Tsai	Ph.D., Stanford Univ., U.S.A.
Tingye Li	Ph.D., Northwestern Univ., U.S.A.

## RESEARCH

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### Research Scope

The research topics of the faculty in GIPO cover a broad spectrum of photonics and optoelectronics technologies, including

- (1) Display technologies: liquid crystal displays (LCD), design and fabrication of organic light-emitting diodes (OLEDs) displays, poly-Si and amorphous thin film transistors for LCD and OLED display, projector techniques, and optical MEMS for display applications.
- (2) Energy technologies: solid-state lighting, solar cells, wide-band-gap semiconductors, novel materials and nanostructures for light-emitting devices.
- (3) Nano-technologies: semiconductor quantum dots, photonic crystals, surface plasmonic crystals, and nm-scale measurements.
- (4) photonic crystals, wavelength conversion, and micro-structure optics.
- (5) Optical fiber communication technologies: active and passive fiber-based devices, and modules and subsystems in optical fiber communications.
- (6) Optoelectronic devices: LiNbO<sub>3</sub> waveguides, silicon-photonics, laser diodes and amplifiers, photo-detectors, waveguide devices, optical MEMS devices, and numerical modeling techniques.
- (7) Bio-photonic technologies: bio-sensing, bio-photonic instrumentation, optical coherence tomography, harmonic imaging, and THz

imaging.

### Major Equipment

Molecular beam epitaxy facilities, metal-organic chemical vapor deposition reactor, laser heated pedestal growth system, X-diffractometry equipment, I-V measurement equipment, organic-semiconductor thin-film deposition system, high-vacuum evaporation purifier, photo-luminescence measurement systems, electro-luminescence measurement systems, evaporator, dry-etching facilities, polishing facilities, temperature- variable photo-excitation time-of-flight carrier transport measurement system, low-temperature systems, high- frequency sampling oscilloscope, high-frequency signal generator, high-frequency signal amplifier, high- frequency optical sampling system, modulated photo reflectance measurement system, ellipsometer, excimer laser, ultrafast Ti:sapphire lasers, ultrafast Cr:forsterite lasers, ultrafast fiber laser, streak camera, Q-switched Nd:YAG lasers, wide-range tunable narrow-band semiconductor laser, monochromators, spectrum analyzers, optical coherence tomography systems, multi-photon confocal microscope, fiber splicer, etc.

### Clean Room Support



▲ Metal organic chemical vapor deposition (MOCVD)



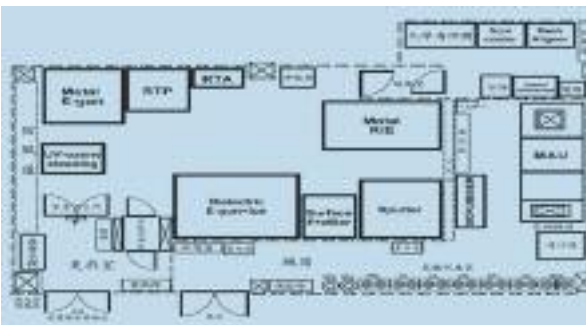
▲ Plasma enhanced chemical vapor deposition (PECVD)



▲ Inductively coupled plasma reactive ion etching (ICP RIE)



▲ UHV surface/interface analysis system



▲ Clean room floor plan



▲ Equipments in the clean room

The Photonics Processing Laboratory managed by the Graduate Institute of Photonics and Optoelectronics, is just established. This clean room laboratory is located at Room 331, Electrical Engineering Building, occupying a total area of 114.6 m<sup>2</sup>. A compartment of 12.5m<sup>2</sup> is designated for the yellow room. The Photonics Processing Laboratory, including all its facilities, is open to all faculty members and researchers at National Taiwan University. The facilities include, but are not limited to, dielectric E-gun, metal RIE, sputter evaporator, mask aligner, RTA, surface profiler, etc.



education to students who will work in photonics- and optoelectronics-related areas in the future. The training emphasizes not only fundamental knowledge, but also the most updated technologies. GIPO offers more than fifty graduate-level elective courses relevant to photonics. GIPO participates in university-wide teaching evaluations to ensure competitive course quality.

### Admission

The Institute admits annually about 100 master students and 30 Ph.D. students. The Institute offers a two-year graduate program leading to a degree of Master of Science. Students can apply for the program through two different processes. Qualified undergraduate students from related departments may apply for admission without taking the entrance examination. Students can also take the written entrance examination held in April every year. The Institute also offers a program leading to a Ph.D. degree. The entrance examination is held annually in May.

For detailed and updated information, please visit <http://gipo.ntu.edu.tw>.

### Degree Requirements

In the Master's program, at least 24 credits of major course work are required. Students are also asked to submit their theses under the supervision of a faculty member and pass an oral examination on their thesis work for receiving the degree.

In the Ph.D. program, at least 18 credits of major course work are required. In addition, students are asked to pass the qualifying examination, submit a dissertation under the supervision of a faculty member, and pass an oral examination on their research work before the degree is awarded.

For more information, please visit <http://gipo.ntu.edu.tw>.

## ACADEMIC ACTIVITIES

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### International Cooperation

Moscow State University, Russia

Moscow State Technical University of Radio Engineering, Electronics and Automation (MIREA), Russia

National University of Singapore, Singapore

Seoul National University, Korea

AOARD, US Air Force, U.S.A.

Arizona State University, U.S.A.

Georgia Institute of Technology, U.S.A.

Northwestern University, U.S.A.

### Research Accomplishments

In 2007, total research funding of the Institute exceeded 150 million NT dollars. In the same year, more than 100 SCI journal papers were published by the faculty of the Institute. Most of them were published in journals of high impact factors.

## FUTURE DEVELOPMENT

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Photonics and optoelectronics have become key technologies in the new century for display, lighting, communication, storage, sensing, and biomedical applications. With the demands of energy saving, explosive use of Internet, high quality displays, multimedia entertainment, and improved medical care, the development and application of photonics and optoelectronics technology have become the indicators of living standards and economic power of a modern society. The Institute will continue to provide high-quality graduate education in photonics and to enhance cooperation with other institutions both within and outside Taiwan.

## CONTACT INFORMATION

---

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# 4. GRADUATE INSTITUTE OF COMMUNICATION ENGINEERING

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## INTRODUCTION

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The Graduate Institute of Communication Engineering (GICE) of NTU was founded on August 1, 1997, comprised of two groups: the Electromagnetics Group and the Communication and Signal Processing Group. GICE was established to educate students to expand their international perspectives and broaden their academic vision.

Electromagnetics Group was originally Radio Wave Research Lab established in March 1970 at the Department of Electrical Engineering of NTU by Professor Jian Feng. This group now has 18 full-time and 1 part-time faculty members. The researches include Electromagnetic Theory and Applications, Antennas, Electromagnetic Interference and Compatibility, Electromagnetic Simulation, RFIC and MMIC, Microwave and Millimeter-Wave Technologies.

Communication and Signal Processing Group, which was the first academic group in Taiwan engaged in the research of communication and signal processing, belonged to the Department of Electrical Engineering before 1997. Now it has 26 full-time and 1 adjunct faculty members. The researches include Wireless Communication, Opti-

cal Communication, Computer Communication, Image Processing, Speech Processing, Digital Signal Processing, Communication System and Networking.

The faculty members make GICE one of the strongest institutes in the field nationwide. Seventeen GICE professors have received the Distinguished Research Award from the National Science Council, nine professors are the Distinguished National Science Council Research Fellows, and ten of them are IEEE Fellows. Besides, Prof. Chun-Hsiung Chen, Prof. Soo-Chang Pei and Prof. Lin-Shan Lee received the National Chair Professor of the Ministry of Education successively, five professors have received the Academic Achievement Award from Ministry of Education, Prof. Chun-Hsiung Chen and Prof. Lin-Shan Lee received the Outstanding Scholar Award from the Foundation for the Advancement of Outstanding Scholarship successively. The newly employed professors also perform well.

GICE has received international attention to its research contributions accumulated over the years, and thus gained opportunities for hosting major international conferences in Taipei. For instance, with 555 scholars from 25 countries, IEEE APMC

2001, one of the three most important international conferences of the microwave field, was hosted by the professors in the Electromagnetics Group. Thanks to the persistent endeavors of Professor Lin-Shan Lee and Kwang-Cheng Chen, we had the honor to host IEEE PIMRC 1996 and IEEE Globecom 2002, which are the most important annual conferences in the communication field worldwide. Globecom 2002 happened to be held during the IEEE Communications Society's 50th Anniversary. Fourteen hundred participants attended this impressive academic conference.

IEEE ICASSP 2009, another important annual Conference in the field of Signal Processing, was hosted by Professor Lin-Shan Lee in Taipei. With a large attendance (about 1700 people), ICASSP 2009 was extolled as "Formosa 2009" by the president of IEEE Signal Processing Society, Jose M.F. Moura.

## FACULTY

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Full-time: 42

Part-time: 2

Distinguished Research Chair Professor: 1

Ph.D. Degree: 45

### Director/ Professor

Kwang-Cheng Chen Ph.D., University of Maryland, USA

### Professor

Lin-Shan Lee Ph.D., Stanford University, USA

Soo-Chang Pei Ph.D., University of California, Santa Barbara, USA

Jingshown Wu Ph.D., Cornell University, Ithaca, NY, USA

Powen Hsu Ph.D., University of Southern California, USA

Hsueh-Jyh Li Ph.D., University of Pennsylvania, Philadelphia, USA

Hung-Chun Chang Ph.D., Stanford University, USA

Shyh-Kang Jeng Ph.D., NTU, ROC

Ju-Hong Lee Ph.D., Rensselaer Polytechnic Institute, Troy, NY, USA

Tah-Hsiung Chu Ph.D., University of Pennsylvania, Philadelphia, USA

Hen-Wai Tsao Ph.D., NTU, ROC

Ruey-Beei Wu Ph.D., NTU, ROC

Yean-Woei Kiang Ph.D., NTU, ROC

Mao-Chao Lin Ph.D., University of Hawaii, USA

- Shi-Chung Chang Ph.D., University of Connecticut
- Zsehong Tsai Ph.D., University of California, Los Angeles, USA
- Ming-Syan Chen Ph.D., University of Michigan, Ann Arbor, USA
- Huei Wang Ph.D., Michigan State University, USA
- Jean-Fu Kiang Ph.D., Massachusetts Institute of Technology, USA
- Chin-Kuang Tzuang Ph.D., University of Texas at Austin, USA
- Homer H. Chen Ph.D., University of Illinois at Urbana-Champaign
- Char-Dir Chung Ph.D., University of Southern California, USA
- Wanjiun Liao Ph.D., University of Southern California, USA
- See-May Phoong Ph.D., California Institute of Technology, USA
- Tzong-Lin Wu Ph.D., NTU
- Tian-Wei Huang Ph.D., University of California, Los Angeles, USA
- Liang-Hung Lu Ph.D., University of Michigan, USA
- Associate Professor**
- Jenho Tsao Ph.D., University of Pennsylvania, Philadelphia, USA
- Tsung-Nan Lin Ph.D., Princeton, USA
- Hsuan-Jung Su Ph.D., University of Maryland at College Park, USA
- Da-Shan Shiu Ph.D., University of California at Berkeley
- Polly Huang Ph.D., University of Southern California, USA
- Yi-Cheng Lin Ph.D., University of Michigan, USA
- Yi-Jan Chen Ph.D., Georgia Institute of Technology, USA
- Hung-Yun Hsieh Ph.D., Georgia Institute of Technology, USA
- Assistant Professor**
- Shin-Chia Lu Ph.D., NTU
- Ping-Cheng Yeh Ph.D., University of Michigan, USA
- Hung-Yu Wei Ph.D., Columbia University, USA
- Kun-You Lin Ph.D., NTU
- Shih-Yuan Chen Ph.D., NTU
- Jian-Jiun Ding Ph.D., NTU
- Chun-Ting Chou Ph.D., University of Michigan, USA
- Borching Su Ph.D., California Institute of Technology, USA
- Adjunct Professor**
- Chun-Hsiung Chen Ph.D., National Taiwan University
- Jin-Fu Chang Ph.D., University of California at Berkeley, USA
- Distinguished Research Chair Professor**
- Thomas S. Huang Ph.D., Massachusetts Institute of Technology, USA

## FACILITIES

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The institute is located on the 5th floor of the Electrical Engineering Building and Barry Lam Hall of EECS. Main laboratories include Electromagnetics Research Lab, Electromagnetic Simulation Lab, Microwave Anechoic Chamber, Microwave/Millimeter wave Circuit Lab, Wireless Communication, Image Processing Lab, Speech Processing Lab, Optical Communication Lab, Digital Signal Processing Lab, Signal Transmission Lab, Computer System Lab, Coding Theory and Its Applications Lab, Wireless Broadband Communication Lab, Multimedia Processing and Communications Lab, Signal Processing for Communication Lab, Distributed Multimedia Computing Lab, Communications, Signal and Information Processing Lab, Computer Music Lab, TONIC Lab, Digital Communications Systems Lab, Advanced Wireless Communication Lab, High-Speed Optical Networking Lab, and Next Generation Wireless Lab.

## COURSES

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### 1.Master Program

The M.S. degree program requires at least one year of graduate study and must be completed within four years upon matriculation. Admission into the M.S. degree program is nominally offered to students with an earned degree of Bachelor of science or equivalent. Requirements of the M.S. degree may be summarized as follows:

#### **The student must complete**

- (1) at least 24 credits of graduate-level course, (excluding Department Colloquium, Seminar, Special Project, Thesis, and Foreign Languages), including at least 12 credits in the student's respective group,
- (2) a written thesis,
- (3) an oral examination that is a defence of thesis and is taken near the completion of the program.

### 2.Ph.D. Program

The degree of doctor of philosophy is offered under the the general regulations of the University. the Ph.D. degree program requires at least two years of graduate study, and must be completed within seven years upon matriculation. admission into the Ph.D. degree program is nominally offered to students who have earned a M.S. degree or equivalent, although students in the M.S. degree program may apply for admission into the Ph.D. degree program before earning their M.S. degrees. For students with earned M.S. or equivalent degrees, requirements of the Ph.D. degree may be summarized as follows:

**The students must complete**

- (1) at least 18 semester-credits of graduate-level courses, (excluding Department Colloquium, Seminar, Special Project, Dissertation and Foreign Languages), including at least 9 credits in the student's respective group,
- (2) a qualification exam given by the faculty of the college which must be completed within 2 years after admission into the
- (3) a written dissertation based on original research,
- (4) an oral examination that is a defense of dissertation research and is taken near the completion of the program,
- (5) M.S. students who are admitted into the

**3. Ph.D.program**

before earning their M.S. degrees are required to complete, in addition to the Ph.D. program, at least 42 credits of graduate-level course(excluding Department Colloquium, Seminar, Special Project, Dissertation and Foreign Languages), including at least 21 credits in the student's respective group.

**ACADEMIC ACTIVITIES**

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- 1 Weekly colloquia given by renowned scholars and experts.
2. Weekly seminars held for effective exchange of research experience.
3. Workshops, academic symposia, and international conferences are organized from time to time by the Institute.

**CONTACT INFORMATION**

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Director: Prof. Kwang-Cheng Chen

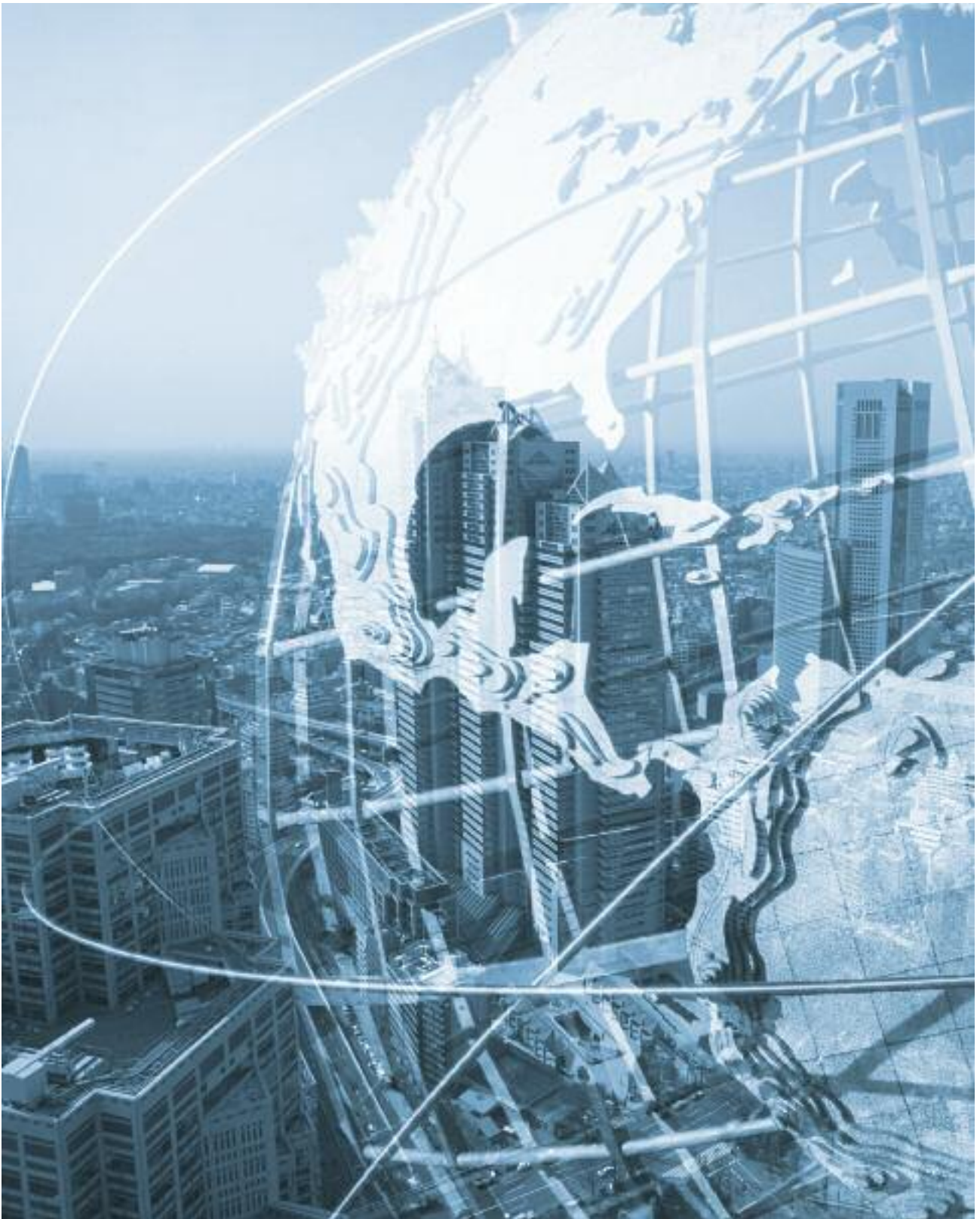
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# 5. GRADUATE INSTITUTE OF ELECTRONICS ENGINEERING

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## INTRODUCTION

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The Graduate Institute of Electronics Engineering (GIEE), established on August 1st, 2001, is the second youngest institute in the College of Electrical Engineering and Computer Science. Aiming for a leading research organization in the new millennium, the GIEE consists of three research groups: Integrated Circuits and Systems (ICS), Nano-Electronics (NE), and Electronic Design Automation (EDA). The research activities at GIEE are highly related to the current and future needs of the global electronics industry. The faculty and students at GIEE continue to conduct innovative researches while maintaining close interaction with industrial partners. The ICS group focuses on the design and testing of communication ICs, system-on-a-chip (SoC) integration, and high-performance circuits for analog, mixed-mode, and digital applications. The NE group emphasizes group IV and compound semiconductor devices, opto-electronic/organic components, device modeling, microelectromechanical systems (MEMS), and display devices. The EDA group is devoted to SoC design methodologies, physical designs, signal integrity, verification, and circuit testing.

Our objective is to give our students, not only the cutting-edge technological knowledge and applications, but also a multidisciplinary engineering background for various career directions. Developing lasting partnerships with prominent international research organizations and semiconductor corporations, GIEE produces more than 150 highly-motivated graduates each year, serving the country and the world with well-balanced, up-to-date technical knowledge. With the best research environment, we are confident and well prepared for the challenges in the ultra-competitive electronics industries. The faculty and the students at GIEE will continue to work for more outstanding research results and contribution to our industry and society.



## FACULTY

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Full-time: 42

Adjunct: 1

Ph.D. Degree: 42

M.S. Degree: 1

### Director/ Professor

Shey-Shi Lu Ph.D., University of  
Minnesota, U.S.A.

### Professor

Way-Seen Wang Ph.D., University of South  
California, Los Angeles,  
U.S.A.

Si-Chen Lee Ph.D., Stanford University,  
U.S.A.

Jenn-Gwo Hwu Ph.D., NTU, R.O.C.

Hen-Wai Tsao Ph.D., NTU, R.O.C.

James B. Kuo Ph.D., Stanford University,  
U.S.A.

Hao-Hsiung Lin Ph.D., NTU, R.O.C.

Liang-Gee Chen Ph.D., National Cheng-Kung  
University, R.O.C.

Sy-Yen Kuo Ph.D., University of Illinois  
at Urbana-Champaign,  
U.S.A.

Tzi-Dar Chiueh Ph.D., California Institute of  
Technology, U.S.A.

Chern-Lin Chen Ph.D., NTU, R.O.C.

Ying-Jay Yang Ph.D., North Carolina State  
University, U.S.A.

Sao-Jie Chen Ph.D., Southern Methodist  
University, U.S.A.

Ching-Fuh Lin Ph.D., Cornell University,  
U.S.A.

Shen-Iuan Liu Ph.D., NTU,, R.O.C.

Chorng-Kuang Wang Ph.D., University of  
California, Berkeley, U.S.A.

Der-Tsai Lee Ph.D., University of Illinois  
at Urbana-Champaign,  
U.S.A.

Chee-Wee Liu Ph.D., Princeton University,  
U.S.A.

Chieh-Hsiung Kuan Ph.D., Princeton University,  
U.S.A.

Yao-Wen Chang Ph.D., The University of  
Texas at Austin, U.S.A.

An-Yeu Wu Ph.D., University of  
Maryland, U.S.A.

Farn Wang Ph.D., The University of  
Texas at Austin, U.S.A.

Chung-Chih Wu Ph.D., Princeton University,  
U.S.A.

Chung-Ping Chen Ph.D., The University of  
Texas at Austin, U.S.A.

Liang-Hung Lu Ph.D., University of  
Michigan, Ann Arbor,  
U.S.A.

### Associate Professor

Hung-Hsiang Cheng Ph.D., Oxford University,  
UK

Ming-Hua Mao Ph.D., Institut fur Festkorper  
Physik, Technische Univer-  
sitat Berlin, Germany.

Tai-Cheng Lee Ph.D., University of California, Los Angeles, U.S.A.

Chien-Mo Li Ph.D., Stanford University, U.S.A.

Jiun-Lang Huang Ph.D., University of California, Santa Barbara, U.S.A.

Tsung-Hsien Lin Ph.D., University of California, Los Angeles, U.S.A.

Jri Lee Ph.D., University of California, Los Angeles, U.S.A.

Yi-Jan Chen Ph.D., Georgia Institute of Technology, U.S.A.

Shao-Yi Chien Ph.D., NTU, R.O.C.

Jie-Hong Roland Jiang Ph.D., University of California, Berkeley, U.S.A.

#### Assistant Professor

Hsin-Shu Chen Ph.D., University of Illinois at Urbana-Champaign, U.S.A.

Chung-Yang Huang Ph.D., University of California, Santa Barbara, U.S.A.

Hsin-Chia Lu Ph.D., NTU, R.O.C.

Kuan-Yu Tsai Ph.D., Stanford, U.S.A.

Yi-Chang Lu Ph.D., Stanford University, U.S.A.

Chih-Ting Lin Ph.D., University of Michigan, Ann Arbor, U.S.A.

Yu-Hsuan Kuo Ph.D., Stanford University, U.S.A.

Wei-Cheng Tian Ph.D., University of Michigan, U.S.A.

#### Adjunct Specialist

Tah-Kang Ting Ms., Case Western Reserve University, U.S.A.

## FACILITIES

The laboratories of GIEE are located among the three buildings of Electrical Engineering School (i.e., EE Building I, II, and III). Main laboratories include: Access IC Design Lab., CAD System Lab., DSP/IC Design Lab., IC Design Lab., Dependable Distributed System and Networks Lab., Microelectronics Lab., NTU-MTK Wireless Research Lab., RF IC Lab., Electronic Design Automation Lab., VLSI Testing and Verification Lab., Infrared Spectrum Lab., Microsystem Research Lab., VLSI Circuit and System Lab., C-V Lab., Molecular Beam Epitaxy Lab., Applied Electronics Lab, Nano-electronics Lab., Integrated Optics Lab., Semiconductor Laser and Ultrafast Optoelectronics Lab., Electronic Circuits Lab., A-Si/Poly-Si TFT Lab., Optoelectronic Material and Device Lab., Organic Optoelectronics, Lab., Photoluminescence Spectrum Lab., E-beam lithography Lab., and Advanced Silicon Device and Process Lab.

The rapidly-growing computer network in GIEE comprises hundreds of computers and workstations, connected to a 100 Mbps network with multiple parallel T3 lines running to individual research laboratories and computer rooms. Research equipment consist of, but is not limited to: spectrum

analyzer, network analyzer, rapid thermal processor, reactive ion etching, mask aligner, plasma enhanced chemical vapor deposition, infrared spectrometer, noise measurement system, Aptix fast prototyping system, and sputtering system.

## COURSES

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GIEE offers programs of study for the Master of Science degree and the Doctor of Philosophy degree, both in Electronics Engineering. In the M.S. program, students must complete a thesis and pass the oral defense in addition to general course requirements. The Ph.D. degree program requires the completion of a qualifying examination, a dissertation based on original research, and an oral dissertation defense. Research areas at GIEE include:

- (1) Integrated circuits and systems, involving digital, analog, mixed-signal, communication IC designs, SOC design, low power ICs, DSP architecture and multimedia ICs
- (2) Computer-aided design, including IC testing, hardware/software co-design technology, VLSI physical design, design automation, circuit simulation system, and MCM/PCB layout design;
- (3) Power electronics system;
- (4) Microsystems with nanometer devices;
- (5) Infrared electro-optics devices;
- (6) Semiconductor devices and ICs, including

- GaAs and SiGe devices;  
(7) Device simulation and circuit simulation.

## CURRICULAR ACTIVITIES

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Department colloquium and group seminars are scheduled weekly. Special talks by leading experts in each of the major fields and other fields are presented frequently to broaden the learning experiences of the graduate students at GIEE.

## CONTACT INFORMATION

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# 6. GRADUATE INSTITUTE OF NETWORKING AND MULTIMEDIA (GINM)

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## INTRODUCTION

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The Graduate Institute of Networking and Multimedia (GINM) is the latest graduate institute in the College of Electrical Engineering and Computer Science (EECS) at National Taiwan University (NTU). The Ministry of Education approved the GINM to offer master and doctoral programs starting in August 2004. GINM pursues an educational and research mission to educate the information technology professionals who will support the development of industry and research institutes in the country for the next century, and has brought together research disciplines such as multimedia, networking, and embedded systems.

Over the last decade, computer networking and multimedia have become an important part of our daily life. With the strong support of academic institutes and government, the Computer, Communication, Consumer Electronics, and Content (so called 4C) industry has become a strong and important business section in the country. To meet the great demand of information technology professionals, the members of the Department of CSIE and CML have increased remarkably. In order to provide better education programs and research facilities, Prof. Ja-Ling Wu started organ-

izing the GINM Planning Committee in 2000. The committee members were well-established faculty members included Prof. Shyh-Kang Jeng, Prof. Hsu-Chun Yen, Prof. Sy-Yen Kuo, Prof. Ming-Syan Chen, Prof. Wan-Jiun Liao from the Computer Science division of the Department of Electrical Engineering, Prof. Ching-Chi Hsu, Prof. Ja-Ling Wu, Prof. Ming Ouhyoung, Prof. Wen-Chin Chen and Prof. Tei-Wei Kuo from the Department of CSIE. Prof. Ja-Ling Wu served as the committee chairman. With the strong support of the Ministry of Education and NTU, the GINM debuted in August 2004.

With the strong support of the Ministry of Education and NTU, the GINM was founded in August 2004. With the lead of Prof. Ja-Ling Wu, the first Director of GINM, and the full cooperation of whole faculty, the institute affairs ran smoothly and a solid foundation for different aspects has been established. In the year 2007, Prof. Yi-Ping Hung was elected as the new Director of GINM. We expect that GINM will have further developments in education and research, and can make a better contribution in improving the quality of life for the whole human being.

## GOAL

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GINM pursues four closely related missions: education, research, university-industry collaboration, and multi-university collaboration missions. Nurturing first-class information technology professionals has always been the most important goal in our educational mission. GINM provides the curriculum that minimizes the gap in educational goals between industry and academia. The Curriculum Planning Committee has designed the programs so that the students graduate with most needed information technology skills, cultivated skills and hands-on experience. In particular, the curriculum of the GINM focuses on networking, multimedia, and system applications. The goal is to educate the students with advanced technology, which meets the needs of the industry in the 4C field.

For the research mission, the GINM encourages multi-discipline researches among the faculty within the institute or with other universities so as to foster the high-quality and advanced researches. We firmly believe that the GINM will be recognized throughout the world as a leader in the research of computer networking and multimedia in the near future. Moreover, the faculty in GINM will incorporate the key goals and directions for future stages of sci-tech development planned by National Science Council as part of our research direction. The research results can, hence, benefit the development of industry in the country.

For cooperation with research institutes and industry in the country, GINM pursues cooperation with other departments/institutes within NTU to promote the research results to the industry. GINM encourages interaction with industry and technology transfer to industry in hopes of advancing the research capability of the industry. With the interaction with industry, the research agenda in the GINM is closely related to research and design needs of industry so as to advance technology development.

GINM also seek the cooperation with research institutes/universities in the country or all over the world. To promote the research results of the GINM, the faculty members are encouraged to attend the international conferences, invite well-established researchers, and organize the international conferences. GINM also accepts the admission from foreign countries and welcomes the faculty member from foreign countries.

## FACULTY

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GINM comprises 46 full-time faculties (including 14 faculties from Department of CSIE, 2 faculties from Graduate Institute of Biomedical Electronics and Bioinformatics, 3 faculties from Graduate Institute of Electrical Engineering, 6 faculties from Graduate Institute of Communication Engineering, 2 faculties from Graduate Institute of Electronics Engineering and 1 faculty from the Department of

Information Management), 18 of them are dedicated to GINM. All the GINM faculties hold Ph.D. degrees. In addition, 3 adjunct faculties have joined GINM since August 2005.

Full-Time Dedicated Faculty members:

### GINM Director/Professor

Yi-Ping Hung Ph.D., Brown University

#### Professors

Ja-Ling Wu Ph.D., Ta-Tung Institute of Technology.

Wen-Chin Chen Ph.D., Brown University

Ming Ouhyoung Ph.D., University of North Carolina, Chapel Hill

Tei-Wei Kuo Ph.D., University of Texas (Austin)

Jane Yung-jen Hsu Ph.D., Stanford University

#### Associate Professors:

Chia-Lin Yang Ph.D., Duke University

Hao-Hua Chu Ph.D., University of Illinois at Urbana-Champaign

Cheng-Fu Chou Ph.D., University of Maryland

Ai-Chun Pang Ph.D., National Chiao-Tung University

Chi-Sheng Shih Ph.D., University of Illinois at Urbana-Champaign

Yung-Yu Chuang Ph.D., University of Washington

#### Assistant Professors

Chieh-Chih Wang Ph.D., Carnegie-Mellon University

Pu-Jen Cheng Ph.D., National Chiao Tung University

Chih-Wen Hsueh Ph.D., University of California (Irvine)

Shou-De Lin Ph.D., University of Southern California

Ming-Sui Lee Ph.D., University of Southern California

Winston H. Hsu Ph.D., Columbia University

### Joint-Appointment Faculty members:

#### Professors:

##### Dept. of CSIE:

Gen-Huey Chen, Jieh Hsiang, Hsin-Hsi Chen, Chiou-Shann Fuh, Yuh-Dauh Lyuu, Pang-Feng Liu, Ruey-Feng Chang, Chih-jen Lin, Hsueh-I Lu and Phone Lin.

##### Graduate Institute of Biomedical Electronics and Bioinformatics:

Yen-Jen Oyang and Kun-Mao Chao.

##### Graduate Institute of Electrical Engineering:

Sy-Yen Kuo and Chin-Laung Lei.

##### Graduate Institute of Communication Engineering:

Soo-Chang Pei, Lin-Shan Lee, S.K. Jeng, Ming-Syan Chen, Hung-Ming Chen and Wan-Jiun Liao.

##### Graduate Institute of Electronics Engineering:

Liang-Gee Chen.

##### Associate Professors:

##### Department of CSIE:

Shih-Wei Liao.

##### Graduate Institute of Electrical Engineering:

Polly Huang.

##### Department of Information Management:

Bing-Yu Chen.

**Graduate Institute of Electronics Engineering:**

Shao-Yi Chien

**Assistant Professors:****Department of CSIE:**

Mong-Kai Ku, Shih-Hao Hung and Hsuan-Tien Lin.

## FACILITIES

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The GINM maintains an array of powerful computers and software for instruction, as well as research laboratories maintained by individual faculty. The facilities are available to all the students and faculties. In the coming years, the GINM will continue to expand its facilities to serve our educational and research mission.

The faculties in the GINM lead nine laboratories:

- Communications and Multimedia Laboratory
- Embedded Systems and Wireless Networking Laboratory
- Image and Vision Laboratory
- Intelligent Agents Laboratory
- Ubicomp Laboratory
- Embedded Computing Laboratory
- Robot Perception and Learning Laboratory
- Web Mining and Information Retrieval Laboratory
- Machine Discovery and Social Networking Mining Laboratory

## PROGRAMS REQUIREMENTS AND COURSES

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Courses in the GINM are categorized into three categories: Multimedia technology, Networking technology and Systems and Application. Each category includes courses offered by our faculty or courses approved by the Committee of Curriculum. With the approval of the director, students can apply for course exemption for related courses taken in other departments.

### Master Program

- (1) Required Courses
  1. Master thesis (must be taken during the last semester of study)
  2. Special project (selective for the first semester, required from the second semester on, at least 2 semesters before graduation.)
  3. Seminar (should be taken for at least 2 semesters)
- (2) To graduate, each GINM master student has to earn at least 24 credits (excluding master thesis, special project and seminar). Among these 24 credits, at least 6 should be from the multimedia technology, at least 6 from networking technology category, and at least 3 from the systems and application category.

### Ph. D. Program

- (1) Required courses
  1. Doctoral Dissertation (12 credits)
  2. Special Project (required for every semes-



ter until the student is eligible to take the Doctoral Dissertation course)

3. Seminar (at least 4 semesters before graduation)

- (2) To graduate, students have to take at 18 credits from GINM (for those entering through direct admission to the Doctoral Program, the minimum credit required is 30). Among these credits, at least 6 credits must be from the category of multi-media technology, credits from networking technology, and at least 3 credits must be from the systems and application category. The credits earned from Doctoral Dissertation, Special Project and Seminar courses cannot be used to satisfy the graduation credits.

## CONTACT INFORMATION

Director: Yi-Ping Hung

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Website: <http://www.inm.ntu.edu.tw>

E-Mail: [inm@csie.ntu.edu.tw](mailto:inm@csie.ntu.edu.tw)

## COURSE LISTS

### Multimedia

Introduction to Digital Signal Processing, Information Theory and Coding Techniques, Multimedia Security, Computer Graphics, Virtual Reality, Computer Vision, Digital Image Processing, Pattern Analysis and Classification, Image-Based Modeling and Rendering, Digital Speech Processing, Video Compression Technique, Standard and Implementation, Video Signal Processing, Geometric Modeling, Digital Image Synthesis, Digital Visual Effects, Artificial Intelligence, Medical Image Graphics, Game Programming, Multimedia Analysis and Indexing, Introduction to Digital Speech Processing, Advanced Topics in Multimedia Analysis and Indexing, Advanced Human Computer Interaction, Machine Learning, Statistical Methods for Intelligent Information Processing,...etc.

### Networking

Advanced Computer Networks, Internet Telephony, Performance Modeling, Personal Communications Services, Network System Management, Software Engineering, Cryptography and network security, Game theory, Strategies of software industry, An introduction to advanced performance modeling, Network and computer security, Complexity-based cryptography, Electronic commerce systems, Advanced web technology, Net arts, Network Simulation and Testing...etc.

### Systems & Application

Information Retrieval and Extraction, Advanced Operating System, Web Retrieval and Mining, Networked SoC Embedded Software Design, Machine Discovery, Advanced Computer Architecture, Real-Time Systems, Intelligent Agents, Multiagent Systems, Fundamentals of Software Patent Practicing, Pervasive & Ubiquitous Computing, Multimedia System-on-chips Design, Robot Perception and Learning, Low Power System Design, Technical Writing and Research Method, Multicores and Their Compilation, Computer Gaming Theory, Machine Discovery, Overseas Internship Program, Embedded Operating System Implementation, Fuzzy Systems and Applications, Lower Power Embedded System Design, Multicore Embedded Systems and Software...etc.



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# 7. GRADUATE INSTITUTE OF BIOMEDICAL ELECTRONICS AND BIOINFORMATICS (BEBI)

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## INTRODUCTION

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Established in August, 2006, our mission is to combine the professional knowledge of electronics and informatics, and to cultivate outstanding and knowledgeable researchers through the integration of the research concerning medical science, life science, and biotechnology so that we can not only fit the direction of our national development but also play an leading role in the cutting edge biotechnology areas around the globe in the next decades.

Biomedical Engineering research covers wide range of various sciences such as biomedical materials, biomedical mechanics, biomedical electronics, bioinformatics, biomedical imaging, biomedical photonics, and clinical engineering. We, NTUBEBI, will devote ourselves to the research of visionary and promising topics, including bioinformatics in post genome era, nano-biomedical technology, and the medical technology needed in aging society. Our research currently focuses on the following areas:

1. Nano-Biomedical Technology
2. Bioinformatics
3. Medical Imaging
4. Medical Informatics
5. Biochip and Biomedical Microelectronics System
6. Electro-Optical Technology

In the past few years, by putting numerous efforts from our talented researchers and distinguished faculties in above areas, we have been able to demonstrate our exceptional capabilities on researches and publish our research results on many international journals which are well known and recognized in academy. Other than that, we also closely cooperate with other schools and departments for multi-disciplinary research, and share our research results through collaboration with institutes and industries to achieve our ultimate goal of improving competitive strength for both companies and individuals in biomedical industry domestically.

## FACULTY

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### Director/Professor

Feipei Lai Ph.D., Univ. of Illinois, Urbana-Champaign.

### Biomedical Electronics Group

#### Professors

Si-Chen Lee Ph.D., Stanford Univ.  
 Ju-Hong Lee Ph.D., Rensselaer Polytechnic.  
 Pai-Chi Li Ph.D., Univ. of Michigan.  
 Pan-Chyr Yang Ph.D., National Taiwan Univ.  
 Shoei-Shen Wang Ph.D., National Taiwan Univ.  
 Yung-Yaw Chen Ph.D., Univ. of California, Berkeley.  
 Jyh-Horng Chen Ph.D., Univ. of California, Berkeley.  
 Chieh-Hsiung Kuan Ph.D., Princeton Univ.  
 Hsiao-Wen Chung Ph.D., Univ. of Pennsylvania.  
 Chii-Wann Lin Ph.D., Case Western Reserve.  
 Eric Y. Chuang Ph.D., Harvard Univ.

#### Associate Professors

Fok-Ching Chong B.S., National Taiwan Univ.  
 Jen-Ho Tsao Ph.D., Univ. of Pennsylvania.  
 Chung-Ping Chen Ph.D., Univ. of Texas  
 Chia-Hsien Cheng Ph.D., National Taiwan Univ.

#### Assistant Professors

Kung-Bin Sung Ph.D., Univ. of Texas.  
 Chih-Ting Lin Ph.D., Univ. of Michigan.  
 Po-Ling Kuo Ph.D., Harvard Univ.

## Bioinformatics Group

### Professors

Cheng-Yan Kao Ph.D., Univ. of Wisconsin, Madison.  
 Yen-Jen Oyang Ph.D., Stanford Univ.  
 Chiou-Shann Fuh Ph.D., Harvard Univ.  
 Ruey-Feng Chang Ph.D., National Tsing Hua Univ.  
 Kun-Mao Chao Ph.D., Pennsylvania State Univ.  
 Hsueh-I Lu Ph.D., Brown University

### Associate Professors

Hsueh-Fen Juan Ph.D., National Taiwan Univ.  
 Y. Jane Tseng Ph.D., Univ. of Illinois.  
 Chiun-Sheng Huang Ph.D., National Taiwan Univ.

### Adjunct Professors

Te-Son Kuo Ph.D., Georgia Institute of Technology.  
 Wei-Kung Wang Ph.D., Johns Hopkins Univ.  
 Tzer-Bin Lin Ph.D., National Taiwan Univ.

## FACILITIES

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Babinet Compensator, Laser Source, Positioning Platform, Optical table, 3 Tesla MRI, Spectrum Analyzer, Clinical Ultrasound Scanner, 4-Axis Scanning System, Flow Simulation System, Servers and Computer Clusters etc.

## COURSES

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### Curriculum Design

#### (1) Required Course

Master Program: Fundamentals of Biomedical Engineering, Introduction to Biomedical Informatics, Group Seminar, Research, and Special Topics.

Doctoral Program: Group Seminar, Research, and Special Topics.

#### (2) Required Course: Master Program

Non-Biomedical Related Major (Select one in four): Physiology, Molecular Biology, Biochemistry, and Introduction of Biological Sciences.

Non-Technology Related Major (Select one in three): Applied Electrics or Electromegnetics (Advisor's approval needed), Object-Oriented Software Design, and Signals and Systems.

#### (3) Elective Course

The elective courses of Biomedical Electronics Group are divided into "Biomedical Signal and Image Processing" and "Biomedical/ Nanometer Electronics". The former includes: Digital Signal Processing, Biomedical Signal Processing, Digital Image Processing, Medical Imaging Systems, Fundamentals of Molecular Imaging, Principles of Medical Ultrasound, Magnetic Resonance Imaging: Principles and Its Applications, Magnetic Resonance Imaging Lab, Special Topics on Medical Ultrasound, and Advanced MR Imaging Technique. The later includes: Advanced Medical Instrument, Medical Electronics, Medical Microsensor, Fabrication and Design in Optical

MEMS, Medical Photonics, Fundamentals of Lasers, Optoelectronic Electromagnetics, Biomedical Optical Spectroscopy and Imaging Techniques, Introduction of Biochip Techniques, and Genechips Methods and Data Analysis.

The elective courses of Bioinformatics Group are divided into "Bioinformatics" and "Medical Informatics". The former includes: Bioinformatics Algorithms, Introduction of Biochip Technologies, Statistical and Computational Methods in Bioinformatics, Mathematics for Computational Biologists, Bioinformatics and Computational Molecular Biology, Data Mining and Machine Learning, Algorithms for Analyzing Biological Sequences, Data Mining Algorithms for Bioinformatics, Genechips Methods and Data Analysis, Mathematical Modeling and Systems Biology, Theory of Statistics, and Special Topics on Graph Algorithms. The later includes: Introduction to VLSI, Medical Information System, Personal Communications Services, Computer Systems Architecture, Advanced Computer Networks, Internet Telephony, Computer Graphics, Computer Vision (I), Digital Visual Effects, Topics in Parallel, Real-times Systems, Advanced Compiler Design, Performance Modeling, Advanced Operating System, Networked SOC Embedded Software, Virtual Reality, and Computer Vision (II).

## ACADEMIC ACTIVITIES

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Workshops, academic symposia, international conferences, or trainings are organized by the Institute.

## CONTACT INFORMATION

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# 8. COMMUNICATION RESEARCH CENTER

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## PREFACE

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The objective of Communication Research Center is to focus on the research and development of the communication-related technologies, to promote academic activities, and to enhance the cooperation with other departments. In addition, the center will also pursue extensive profound study of their impacts on society, politics, economy, and culture.

## ORGANIZATIONS

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The Communication Research Center was founded in March 1992. The goal of the center is to promote the long-term national policy on telecommunication development, to train future communication engineers and managers, and improve local communication industry.

Based on the well-established foundation laid down by the Department of Electrical Engineering, and Department of Information Engineering, and Graduate Institute of Communication Engineering, and the Center will carefully select the direction of research and development and provide professors with a favorable research environment.

## CURRENT ACTIVITIES

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The center research projects are conducted in cooperation with industry. The main cooperation organizations are Chung-Hwa Telecommunication Research Laboratory (中華電信研究所), Computer and Communication Research Institute of ITRI (CSIST, 工研院資通所), Chung-Shan Institute of Science and Technology (中科院), Directorate General of Telecommunication of Ministry of Transportation and Communications (交通部電信總局) and other industry companies. The center also cooperates with YEN TJING LING industrial Research Institute (慶齡工業研究中心) and offers several training programs.

The Communication Research Center has arranged Chunghwa Telecom Co., Ltd. (CHT, 中華電信) to sign the collaboration to agreement with NTU on Jan. 16, 2008. The collaboration activities will include special research projects and training courses. Besides, we are also planning many other programs, such as

### 1. Academic Activities

#### · Academic research projects

Regarding the projects funded by the government, the main funding sources are National Science



Council and the National Technology Program for Telecommunication (國科會電信國家型計畫). The participants include the professors from College of Electrical Engineering and Computer Science, and other universities such as National Tsing Hua University, National Chiao Tung University, National Taipei University of Technology. On the other hand, we also have collaborative projects from other industries and research institutes, such as CHT, ITRI, CSIST, Directorate General of Telecommunication of Ministry of Transportation and Communications.

#### • International Interactions

We have invited a number of IEEE Fellows for seminars and short courses. On the other hand, we also worked together with IEEE Taipei Section, Microwave Theory and Techniques Society, Signal Processing Society and Communications Society to arrange the visit of international researchers and scholars to our center.

## 2. Training Programs

We have been collaborated with YEN TJING LING industrial Research Institute, Department of Industrial Technology and Industrial Development Bureau of Ministry of Economic Affairs (經濟部技術處與工業局) to offer various training programs. Besides, we further coordinated to form the “Cross-University Centers” under the “MOE Human Resource Program for ICT (教育部資通訊人才培育先導型計畫)” to promote the training of human resources for the information and communication related areas. Our center

also planed to offer the “2008 EM Education Initiative- Summer Program”. This program is supported by IEEE EM related societies under Taipei Section and will provide a overview of the EM area for graduate level to the fresh master students in Taiwan.

## 3. Industrial Collaborations and Interactions

Besides the research projects from Chunghwa Telecom and other institutes, we have collaborated with Communication Industry Alliance of Taiwan Electrical and Electronic Manufacturers Association (CIA, 通訊產業聯盟), to host an on-campus recruiting activity in Feb. 2008. The participated companies include MediaTek Inc. (聯發科技), Taiwan Semiconductor Manufacturing Company Limited (TSMC, 台積電), MiTAC International Corporation (MiTAC, 神達電腦), Gemtek Technology Co., Ltd. (Gemtek, 正文科技), and etc. This activity has attracted more than 150 students, and received positive feedbacks from the participated companies.

## FUTURE PROSPECT

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The center will lead key research projects in cooperation with government, research organizations, and industry. The center will also cooperate with the YEN TJING LING Industry Research Institute to offer several communication area training programs. The future research areas will include the following:

1. Advanced networking, including multimedia (such as voice, data, image, and video), high-speed integrated service networks, and high-speed switching technology.
2. Communication electronics, including electronic devices, systems, microwave and millimeter wave circuits and related VLSI technology required by the development of communication.
3. Digital signal processing, including digital video and speech processing, wavelets, and signal processing for wireless communications.
4. Fiber optical communication, including research on system and applications of broad bandwidth, large capacity, and high-speed fiber optical communication.
5. Wireless communication, including areas in packet radio, satellites, microwave communication, personal communication services, and optical wireless communications.
6. Electromagnetic wave theory and applications, including problems of EM waves and light waves encountered along the transmission path.
7. New switching technology, including multimedia, high-density, high-capacity, high-speed new switching technology and photonic switching in optical communication.
8. Communication theory and coding techniques, including fundamental devices of communication systems, coding techniques for the improvement of reliability and security.
9. Other areas, such as photonic switching and quantum communications, and etc.

## CONTACT INFORMATION

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Formation Date: March 1992

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# X. COLLEGE OF LAW



## Academic Units

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- Department of Law
- Graduate Institute of Interdisciplinary Legal Studies

## Affiliated Units

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- Public Law Center
- Fundamental Legal Studies center
- Civil and Commercial Law Center
- Center of Criminal Justice
- Finance and Economic Law Center
- Center for Law and Society
- Center for Law and Technology and Ethics
- Asian Center for WTO and International Health Law and Policy
- Center for Human Rights and Jurisprudence
- Center for Corporate and Financial Law
- Policy and Law Center for Environmental Sustainability
- Center for European Laws

## The Present & Former Deans

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Yih-Nan Liaw	(1998-2002.7)	Chang-Fa Lo	(2003.10-2006.7)
Tzong-Li Hsu	(2002.8-2003.9)	Ming-Cheng Tsai	(2006.8-present)



## HISTORY

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The College of Law used to be the Law Department of the previous College of Law, which also included the Departments of Political Science, Social Science, and Economics. On June 15, 1996, it was resolved at the second meeting of the University Council during the spring term of 1995 academic year to divide the previous College of Law into the College of Law and the College of Social Science, effective from August 1, 1999. At present, under the College of Law, there exist the Department of Law (with undergraduate and graduate programs) and the Graduate Institute of Interdisciplinary Legal Studies. Under the Department of Law, there exist three divisions, which are the Division of Legal Science, the Division of Judicial Administration, and the Division of Economic and Financial Laws. Undergraduate legal education provides basic training for law students to become legal professionals. It is the college's educational policy to maintain a balance between theoretical research and practical training. The college also supports the teaching programs provided by the Division of Continuing Education and Professional Development.

The goals of our graduate legal education are to expand academic frontiers and to train top-level academic researchers. The graduate program of law is divided into eight specialities: "Fundamental Legal study," "Public Law," "Criminal law," "Civil Law," "Commercial Law," "Economic Law,"

"Financial and Tax Law," and "International Law". In recent years, we have striven to promote the quality and quantity of our research. The Graduate Institute of Interdisciplinary Legal Studies has been concentrating on interdisciplinary legal studies. It is expected that law students with different expertises should not only offer legal professional service, but also devote themselves to the academic research in the future. In order to highlight and promote scholarly research in team work, the research centers of various law fields have been set up. They are the twelve centers as follows: "Public Law Center," "Fundamental Legal Studies Center," "Civil and Commercial Law Center," "Center of Criminal Justice," "Center for Law and Society," "Center for Law, Technology and Ethic," "Finance and Economic Law Center," "Center for Corporate and Financial Laws," "Center for Human Rights and Jurisprudence," "Asian Center for WTO and International Health Law and Policy," "Policy and Law Center for Environmental Sustainability," and "Center for European Laws."

## FACILITIES

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### Collections

The Department of Law and the Department of Political Science share the Law Research Library. This Library has a distinctive collection of professional periodicals in foreign language, as well as manuscripts, books and treatises in Chinese and foreign languages, related to law and to political science. The Library's collection includes more than 65,000 volumes, 400 current periodicals and electronic databases, including Fa Yuan Law Sources, Root Grand Legal Database, Westlaw International Hein-On-Line, Lexis-Nexis JP, Lexis-Nexis Recht and so on.

The library also provides access to various on-line databases in Chinese and foreign languages, via the connection to the NTU Intranet (campus network), the Taiwan Sci-Info Network of National Science Council, and the Legislative data System of the Legislative Yuan.

### Teaching & Practical Training Facilities

Moot Court

Reserved for moot court training.

Computer Room

Provided as teaching and research for students.

### Legal Aid Society

Under the supervision of professors from the Law Department, the Legal Aid Society provides free legal consultation to the public on Saturday afternoons.

## RESEARCH

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### < NTU Law Journal >

The journal was first published in 1971 as a semi-annual periodical; since 2007, it has been issued quarterly. The NTU Law Journal is one of the top-ranked legal periodicals in Taiwan and is available in the libraries of more than one hundred universities and academic institutions around the world. This Law Journal is collected as a TSSCI periodical by the National Science Council Science Research Center.

### < NTU Law Review >

NTU Law Review was established in 2006 as an English periodical in response to the trend of internationalization. It aims to elevate the international academic status of College of Law, NTU, and to provide Taiwanese scholars with more opportunities to present their research results to the world. The Review publishes the papers and articles which investigate the judicial decisions, precedents and the legal science in Taiwan and abroad and reflects the latest academic interest. By its biannual publication in March and September, the Review serves as a pluralistic and international platform for Taiwanese scholars to share their academic results with the international academia and also for the foreign scholars to introduce their own research to Taiwan. It is hoped that the Law Review will further and promote the development of legal studies in Taiwan.



## NTU Legal Series

A series of law books has been published by the faculty members of the College of Law; A total number of 192 books has already been published under NTU legal series.

## GOALS

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The College of Law will continue to bring together professors with different specialties through the research centers, and to encourage development of advanced, profound interdisciplinary studies. By holding major domestic and international conferences, the self-styled “Pioneer of Legal Study in Taiwan” would be realized via these research performances.

The College of Law has been actively promoting international academic exchange. It has signed a large number of cooperation agreements with outstanding universities in Asia, Europe, and America. Cooperative research projects have been undertaken and conferences are held regularly. We hope to bring forth Taiwan’s legal experiences and fresh ideas of professors into international academic circles, and elevate the NTU College of Law to a leading law school among the international law institutes.

As mentioned above, the newly established Graduate Institute of Interdisciplinary Legal Studies has started the legal education for non-law graduates.

With diversified courses and excellent legal training programs, this institute has received great recognition from the society and attracted large numbers of applications every year.

It is expected that these law students with different expertises would be endowed with legal professional talents, and would join in our academic research in the future.

## CONTACT INFORMATION

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# 1. DEPARTMENT OF LAW

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## INTRODUCTION

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The Department of Law dates back to the Law Faculty under the College of Liberal Arts and Political Science, Taihoku (Taipei) Imperial University while Japan ruled over Taiwan. After the Second World War, the Imperial University was renamed National Taiwan University, and the College of Liberal Arts and Political Science was separated into the Colleges of Liberal Arts and of Law, while the Law Faculty was also renamed the Law Department. Together with the later re-established Department of Political Science and the Department of Economics, the Law Department was administrated under the College of Law for many years. In August 1999, the College of Law was formally upgraded from the Law Department under the Former College of Law, and the Department of Law has been under the College of Law since then.

Initially, there were no divisions within the Law Department. In 1953, the Law Department established a 「Special Program for Legal Study,」 at the request of the Ministry of Judicial Administration. Two years later, this Program was merged into the Law Department and became a new 「Division of Judicial Administration」. The original Law

Department thus was renamed again the 「Division of Legal Science.」 The course requirements for both Divisions are slightly different: the Division of Legal Science emphasizes the study of Anglo-American Law, while the other Division puts more weight on court proceedings. In 1990, the Law Department started its third division, 「Division of Economic and Financial Law」, in hope of coping with rapid social changes and growing demand for legal professionals capable of handling economic and financial issues. This latest Division offers courses related to finance, taxation, trade and economic law. Ever since, the Law Department has included these three Divisions. The undergraduate legal education is aimed at providing basic training for legal professionals facilitating the development of state and society. It has been our educational policy to maintain a balance between theoretical research and practical training. Thus, our Department has long supported a public service student organization, 「Legal Aid Society.」 The society has proved to be an excellent forum for students to practice law and to make contributions to society.

The Graduate Institute of Law was initially the graduate (master) program started in 1955, which had two Divisions: 「Public Law」 and 「Eco-

conomic Theory.」 In the following year, both Divisions were upgraded into three different graduate institutes: Law, Political Science and Economics, each affiliated with its own Department. In 1970, the Graduate Institute of Law was further separated into three Divisions: 「 Fundamental Legal study,」 「 Public Law」 and 「 Civil and Criminal Law.」 In 1990, the 「 Division of Civil and Criminal Law」 was then divided into two Divisions: 「 Criminal Law」 and 「 Civil and Commercial Law.」 As a result, the Institute of Law currently comprises the following divisions: “Fundamental Legal Studies”, “Public Law”, “Civil Law”, “Criminal Law”, “Financial and Tax Law”, “Economic Law”, “International Law” and “Commercial Law”. The doctoral program (PH.D. in Law) was established in 1971, but did not admit its first student until 1974. The goals of graduate legal education have been to pursue expanding academic frontiers and train top-level academic researchers. In recent years, we have been making extra efforts to promote both the quality and quantity of our researches. Also, we have been expanding the library collection of publications and journals in Chinese and foreign languages in order to meet the needs of teaching and researching.

To cater to the needs of a changing time, adjusting the inherent education goal and methods is one of the main aims as well. We believe that interdisciplinary training is required to analyze and effectively solve real-life cases. Thus, the combi-

nation of substantive and procedural law is especially emphasized. The curriculum aims to fulfill this need, and the integration of continental European Law and Anglo-American Law is another main focus to raise the standard of local education of law and enrich research materials. At the graduate institute level, students are stimulated to develop research capacity. The institute continues to enhance the mechanism for academic paper publication and encourage the faculty and students to organize academic seminars more frequently to exchange knowledge and increase a sense of bonding.

## FACULTY

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Full-time: 39

Part-time: 14

Doctoral Degree Holders: 50

Master Degree Holders: 4

### Chair/Professor

Ming-Cheng Tsai Dr. jur., Munich Univ.,  
Germany

### Full-Time

#### Professor

Mao-Rong Huang Dr. jur., Tubingen Univ.  
Germany

Tze-Lung Chen Dr. jur., Frankfurt Univ.,  
Germany

Jiunn-Rong Yeh S.J.D., Yale Univ., U.S.A.

Chang-Fa Lo S.J.D., Harvard Univ.,  
U.S.A.

Jung-Chien Huang Dr. jur., Bonn Univ.,  
Germany

Ming-Yan Shieh Dr. jur., Munich Univ.,  
Germany

Sheng-Lin Jan Dr. jur., Frankfurt Univ.,  
Germany

Keh-Chang Gee LL.M., NTU, Visiting  
Fellow in Munich Univ.,  
Germany

Tay-sheng Wang Ph.D. in Law, Univ. of  
Washington at Seattle,  
U.S.A.

Mau-Sheng Lee Dr. jur., in Law, National  
Hitotsubashi Univ., Japan

Ming-Chiang Lin Dr. jur., Heidelberg Univ.,  
Germany

Wen-Yu Wang S.J.D., Stanford Univ.,  
U.S.A.

Chueh-An Yen Dr. jur., Munich Univ.,  
Germany

Maw-In Tsai Dr. jur., in Law, National  
Nagoya Univ., Japan

Tzu-Chiang Chen Dr. jur., Munich Univ.,  
Germany

Jau-Yuan Hwang S.J.D., Harvard Univ.,  
U.S.A.

Ming-Jye Huang National Hitotsubashi Univ.,  
Japan

Jaw-Perng Wang S.J. D., Univ. of Chicago,  
U.S.A.

Tsung-Fu Chen S.J.D., New York Univ.,  
U.S.A.

Chung-Wu Chen Ph.D. in Law, Paris I Univ.,  
France

Wang-Ruu Tseng Ph.D. in Law, London Univ.,  
U.K.

#### Associate Professor

Chin-Bi Lin Ph.D. in Law, National Keio  
Univ., Japan

Huang-Chih Chiang Ph.D. in Law, London Univ.,  
U.K.

Shu-Huan Shyuu Ph. D. in Law, NTU

Tze-Shiou Chien S.J.D., Univ. of George-  
town, U.S.A.

Chien-Liang Lee Dr. jur., Gottingen Univ.,  
Germany

Miao-Fen Chen	Dr. Jur., Gottingen Univ., Germany	Jen-Kong Ko	LL.M., NTU
Tzung-Jen Tsai	Dr. jur., Munich Univ., Germany	Tse-Tung Ko	Ph.D. in Law, Paris Univ., France
Yu-Hsiung Lin	Dr. jur., Munich Univ., Germany	Dominique T.C. Wang	Ph.D. in Law, Univ. of Lausanne, Switzerland
Andrew Jen-Guang	Lin S.J.D, Univ. of Duke, U.S.A.	Tsung-jung Liu	Ph.D. in Law, NTU
Kuan-Ling Shen	Dr. jur., Heidelberg Univ., Germany	Yih-Nan Liaw	Dr. jur., Tubingen Univ., Germany
Wen-Chen Chang	S.J.D., Yale Univ., U.S.A	Syue-Ming Yu	S.J.D., Univ. of California at Berkeley, U.S.A.
Huang-Yu Wang	Dr. jur., Heidelberg Univ.,Germany	Tzong-Li Hsu	Dr. jur., Gottingen Univ., Germany
<b>Assistant Professor</b>		Tzu-Yi Lin	S.J.D, Cornell Univ., U.S.A.
Neng-Chun Wang	Dr. jur., in Law, National Tokyo Univ., Japan	Lian-Gong Chiou	Dr. jur., in Law, National Tokyo Univ., Japan
Chao-Ju Chen	S.J.D., Univ. of Michigan, U.S.A.	Chih-Hsiung Hsu	LL.M., NTU; researcher at Graduate Schools for Law and Politics, National Tokyo Univ., Japan
Hsin-Chun Wang	Ph.D in Law, London Univ., U.K.	Mao-Jung Huang	Dr. jur., Tubingen Univ., Germany
Ming-Hsin Lin	Dr. jur., Munich Univ., Germany	<b>Associate Professor</b>	
Ying-Hsin Tsai	Dr. jur., in Law, National Tokyo Univ., Japan	Chih-Hsiung Hsu	LL.M., NTU, Visiting Fellow in National Tokyo Univ., Japan
Tsung-Chou Wu	Ph. D. in Law, NTU	Peh-Sung Chu	Dr. jur., candidate, National Tokyo Univ., Japan
Shih-Chun Huang	Dr. jur., in Law, Hokkaido Univ., Japan		

**Part-Time****Professor**

Tong-Schung Tai	Dr. jur., Mainz Univ., Germany
Peter Jen-huong Wang	Dr. jur., Heidelberg Univ., Germany

## FACILITIES

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### 1. Collection

The Library of the College of Law is located on the first and second floor of Wan Tsai Research Hall and covers a floor area of 1365 square meters (412 Ping), with a capacity to accommodate 55,000 books and journals. The collection includes publications in several widely-spoken languages, such as English, German, French, Japanese and Chinese. There is a total of 29,000 books and 15,000 past and current issues of 365 journals. The Department continues to expand its collection of books and journals to meet the purpose of research and education.

### 2. Teaching and Practical Training Facilities

- (1) Moot Court : Reserved for moot court training.
- (2) Computers and Computer Room: Located on the fifth floor of the Tsai Lecture Hall with 20-odds computers and other facilities as digital teaching and research tools.

Being in the information-surrounded conditions, the computer room is on the 5th floor of the Integration Building. Insides, there are tens of computers and other digital facilities for teaching and students trainings. The Law College has also set up stations of wireless Internet under two rows of classrooms and the professors research rooms. So far, the power and speed are still under the initial development. Besides, to build better quality TAnet, College of Law would also endeavor to

connect to the better-qualified Taiwan Northern Intranet.

### (3) Legal Aid Society

The society is under the supervision of Professor of Law Department, providing free legal consultation to the public as an approach to contribute to the society by putting the students' learning into practice.

## COURSES

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The Law Department is separated into three Divisions: Legal Science, Judicial Administration, and Economic and Financial Law. Each student has to complete a minimum of 150 credits to receive a law degree (LL.B.). In terms of required courses, the Division of Legal Science emphasizes the study of Anglo-American Law, comparative law and legal theory. Students of this Division have to take 「Introduction to Anglo-American Law」 in their sophomore year, and then both 「Contract Law」 and 「Tort Law」 in the junior year. The Division of Judicial Administration focuses on court proceedings and practical training courses. Students of this Division therefore have to take 「Criminal Trial Practice」, and certain credits from the pool of judicial procedural courses during the fourth year. The Division of Economic and Financial Law instead concentrates on study of laws involving taxation, economy and finance. Students of this Division have to take 「Econom-



ics」 and at least sixteen credits from the specially designed pool of courses before graduation

## GRADUATE INSTITUTE OF LAW

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The Graduate Institute of Law offers both the LL.M. and Ph. D. in Law programs. The master program is separated into several Divisions: Fundamental Legal Study, Public Law, Criminal Law, Civil and Commercial Law (will be divided into Civil Law division and Commercial Law division since the academic year of 2009), Financial and Tax Law, Economic Law, and International Law established in the academic year 2005. Each student has to choose a specific Division upon taking the admission exam. The minimum course requirement for the master program is 24 credits, and 18 credits for doctoral students. In addition, each graduate student has to pass a qualifying exam, then submit a written master thesis or doctoral dissertation, and complete a successful oral examination to fulfill the degree requirements.

The aim of the Graduate Institute is to train advanced legal researchers. All the graduate courses are conducted in seminar format, with special emphasis on students' foreign languages. For this very purpose, each year our Graduate Institute offers selected readings on English, German, French and Japanese legal materials to improve graduate students' ability in reading literature in foreign languages..

## ACADEMIC ACTIVITIES

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1. The College of Law publishes NTU Law Journal quarterly, the latest publication being volume 36, issue 2. We also sponsor publication of law books as the NTU Legal Series, which is published till volume 192 so far.
2. On-going exchange programs with Graduate Institute and Law Department of Hokkaido University, Japan. Each year, 2 students from the Law Department, NTU, may participate in the exchange program in Japan for 1 year.
3. On-going exchange agreement with Vrije University Amsterdam, the Netherlands. Every year, 2 students from the Law Department, NTU, may join the half-year exchange program in the Netherlands.
4. The College of Law is one of the founding members of Asian Law Institute, ASLI. We participate in the Council every year and recommend professors to visit and do research in Singapore University, Singapore.
5. The College has signed exchange agreement with the law departments or law schools in the following universities: Hokkaido University, Nagoya University and Waseda University in Japan; National University of Mongolia; India University; Seoul National University; Washington University in St. Louis and University of Washington-Seattle; Vrije University Amsterdam, the Netherlands. Each academic year these institutes accept 2-4 students from the College for one-year or one-semester exchange program.

6. The College has signed a double-masters agreement with Washington University in St. Louis. Eligible students from our master program can apply for the double masters program.
7. To boost academic exchanges, the College has also signed academic exchange agreement or memorandum of understanding with Nagoya University, Hokkaido University, Institute of Intellectual Property, Hitotsubashi University, Kyoto University, and Meijo University in Japan; National University of Mongolia; India University; Korea Legislation Research Institute, Seoul National University, and Ajou University School of Law in Korea; Vrije University Amsterdam, the Netherlands; Shanghai Jiao Tong University and Renmin University in China; University of Malaya; Institute of Economic Law, University of Hamburg; University of Washington-Seattle. The collaboration with these institutes has yielded fruitful results.

## CAREERS AND FURTHER STUDIES

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### ■ Professional abilities

Professional knowledge in legal science and basic knowledge in social science

### ■ Career options

Judge, lawyer, legal consultant, legal assistant in public and private institutes, academic researcher, government official, member of Parliament, member of the Control Yuan, assistant in Legislative Yuan, etc.

## CONTACT INFORMATION

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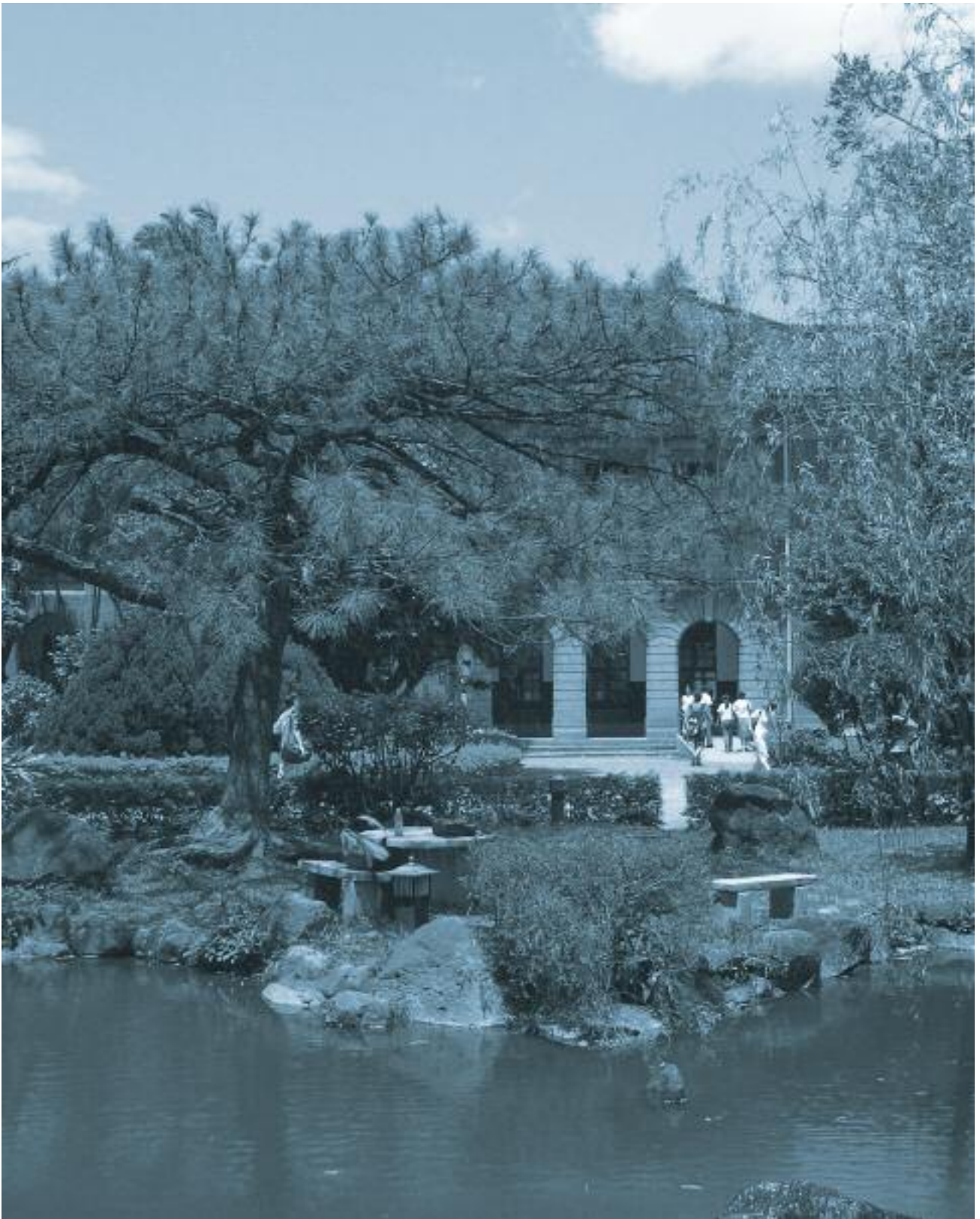
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## 2. GRADUATE INSTITUTE OF INTERDISCIPLINARY LEGAL STUDIES

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### INTRODUCTION

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After years of preparation, the Graduate Institute of Interdisciplinary Legal Studies started to admit students of the first class in the 2004 academic year. The establishment of the Institute reflects the challenges faced by the traditional legal education and responds to the need of legal experts in various fields.

Legal education in the 21st century encounters enormous challenges, one of which comes from the development of telecommunication and information technology. This results in sharp competition among countries and creates new legal issues. Genetic science, or more broadly, biotechnology, has also broadened the dimension of legal researches/studies/practices, particularly with regard to morality, ethics and environment. As educationists, we just cannot avoid asking ourselves whether the current legal system is able to reflect and to cope with the changes we have observed, and whether the current system of legal education is sufficient to nurture experts to respond to the global trend.

Another challenge is caused by the introspection on value conflicts among the main civilization in the world. The economic weakness and social problems in the third world countries have prevented these countries from enjoying stable constitutionalism and democratic system. There is also the rugged and rough situation of human rights protection in many countries after the post cold war era. Even in Taiwan, although the constitutionalism and democratic system have come to become the common values in the mind of Taiwanese people, there are still different views about the specific ways of realizing the two common values. Legal education must take this situation into account in all seriousness.

After the establishment of the WTO, the political and economic globalization has also posed another challenge to the legal education. The new relations created by the WTO have forced countries to adjust their domestic policies and the diplomatic policies toward other countries. In addition to these new relations, Taiwan would also have to deal with its complicated relations with China. The legal education in the past had focused less on macro political, social and economic aspects, and less on nurturing law experts with financial and economic expertise. Thus it is necessary to create new system

of legal education to respond to such demand.

Considering these new challenges and the relevant legal issues brought about by such challenges, we decided to establish the Graduate Institute of Interdisciplinary Legal Studies to enroll students with strong backgrounds in other fields to be trained as legal professionals or researchers with legal knowledge. We believe that the students from various fields of studies, such as economics, political science, commerce, sociology, philosophy, among others, are capable of integrating their previous learning into the studies of law. The College of Law of National Taiwan University has its long tradition of legal research and legal education. Likewise the University itself is a well-developed integrated university with a wide variety of different and strong fields of studies. The College of Law already has ample experience in interdisciplinary studies. These should help to ensure the success of this Institute. We hope that the Institute will be able to play a leading role in the legal education and academic researches with particular foci on technology and sustainable development; human right protection and constitutionalism; and finance, taxation, economics, trade and national development.

We expect that the founding of this Institute will bring new changes to the legal education and lead it into a new era, in which a new paradigm can be established.

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## FACULTY

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### Director/Professor

Jaw-Perng Wang      S.J.D., University of  
Chicago, U.S.A.

### Full-time

#### Professor

Chang-Fa Lo            S.J.D., Harvard University,  
U.S.A.

Tay-Sheng Wang      Ph.D. in Law, University of  
Washington, U.S.A.

#### Associate Professor

Yu-Hsiung Lin         Dr. jur.,Munich University,  
Germany

Andrew Jen-Guang Lin  
Dr. jur., Duke University,  
USA

#### Assistant Professor

Ming-Hsin Lin         Dr. jur.,Munich University,  
Germany

Ying-Hsin Tsai        Dr. jur., National Tokyo  
University, Japan

#### Adjunct professor

Wen-Yeu Wang        J.S.D., Standford University,  
U.S.A.

Maw-in Tsai            Dr. jur., National Nagoya  
University, Japan

Jau-Yuan Hwang      S.J.D., Harvard  
University ,U.S.A.

Ming-Jye Huang        Dr. jur., National Hitotsubashi  
University ,Japan

Tsung-Fu Chen         J.S.D., New York Univer-  
sity, U.S.A.



## FACILITIES

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College of Law facilities are shared by the Department of Law and Graduate Institute of Interdisciplinary Legal Studies. A broad description of these facilities follows.

### Library

We consider the Library being the center of intellectual life at the College of Law. The library system comprises NTU Library, College of Law Library and College of Social Sciences Library.

The College of Law Library owns a collection of print, microform, audio-visual, and electronic resources with an equal emphasis on teaching and research. Currently the College of Law Library collection has more than 29,000 print volumes, including master theses, doctor dissertations, and various kinds of volumes in law. The College of Law Library also subscribes to WESTLAW, and other major sources of legal information available electronically. The collection also includes a large number of law reviews, treatises, and other secondary sources needed for comprehensive legal research.

### Computers

The college owns one computer room, which includes tens of Windows-based computers. The computers have the functions of word processing, excel calculating, presentations software, and provide access to the Internet browsing and online

research via web database, WESTLAW. Laser and inkjet printer are available in the computer lab.

In addition, law student using windows-based laptop computers connect to the Internet and selected research database via several network outlets located throughout the College of Law Library. Our well-established web facilities help to build excellent communication between faculty and students; also enhance the teaching and learning. Moreover, this College is planning to establish an all-aspects e-learning and e-tea. Wireless network are available in and around the College of Law.

## COURSES

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Each student has to complete a minimum of 96 credits to receive a master degree, 50 credits of them required. Those required courses include: Constitutional Law (4), Administrative Law (4), Introduction of Civil Code (4), Civil Code-General Provisions of Obligation (6), Civil Code-Kinds of Obligations (4), Civil Code-Property (2), Code of Civil Procedure (6), Company Code(4), Code of Bills and Notes(2), Criminal Code-General Principles (6), Criminal Code-Kinds of Offenses (4), Code of Criminal Procedure (4).

There are 46 credits for selective courses, among which 6 credits are interdisciplinary courses. Students can decide to take course of this kind from other graduate institutes in the University. They can also take the selective courses offered in the Department of Law for up to 22 credits. Students must complete a master thesis before graduation. They are given master of law degree after successful completion of the credits.

## ACADEMIC ACTIVITY

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The establishment of the Institute is based on the diverse social development and the increasing complication of norms. In order to promote interaction between the legal science and other research fields, the Institute holds occasional interdisciplinary seminars and forums.

## CONTACT INFORMATION

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E-mail:giils@ntu.edu.tw





# XI. COLLEGE OF LIFE SCIENCE



## Academic Units

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- Life Science
- Biochemical Science and Technology
- Graduate Institute of Zoology
- Graduate Institute of Plant Biology
- Graduate Institute of Molecular and Cellular Biology
- Graduate Institute of Ecology and Evolutionary Biology
- Graduate Institute of Fisheries Science
- Graduate Institute of Biochemical Sciences
- Graduate Institute of Microbiology and Biochemistry
- Institute of Fishery Biology
- Committee of Fishery Extension

## The Present & Former Deans

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Yao-Sung Lin

(2003.8-2006.7)

Chu-Fang Lo

(2006.8-present)



## INTRODUCTION

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The College of Life Science originated in the Division of Zoology, Botany and Agricultural Chemistry of the Taihoku Imperial University during the Japanese Occupation. The University was renamed as National Taiwan University in 1945 after the retrocession of Taiwan to the Republic of China. The three former divisions were restructured as the Departments of Zoology and Botany in the College of Science, and the Department of Agricultural Chemistry in the College of Agriculture. The Department of Agricultural Chemistry was further divided into the Division of Agricultural Product Processing and the Division of Soil and Fertilizer in 1961. The Graduate Institute of Biochemical Sciences was established in 1972 and the Graduate Institute of Fisheries Sciences in 1986 in the College of Science. In the last twenty years, research and development in the life sciences and related fields have advanced rapidly. In order to elevate educational and research standards to higher levels and to attract the best students, the College of Life Science was established in 2003.

The College of Life Science includes two undergraduate departments and seven graduate institutes. The two undergraduate departments, the Department of Life Science and of Biochemical Science and Technology, provide resources for the study of life science in both its biological and chemical aspects. This organization provides both variety as well as many research opportunities. The

Department of Life Science was restructured from the former Department of Zoology and Botany, and from the former Institute of Fisheries Science. The members of these departments and institute were also reorganized into five graduate institutes, including the Institutes of Zoology, Plant Biology, Molecular and Cellular Biology, Fisheries Science, and Ecology and Evolutionary Biology. The Department of Biochemical Science and Technology was restructured from the former Department of Agricultural Chemistry in the College of Agriculture and the Institute of Biochemical Sciences in the College of Science. The members of the two organizations were also reorganized into the Institute of Microbiology and Biochemistry, and the Institute of Biochemical Sciences. Students enrolled in undergraduate programs are required to complete four-year programs. All seven institutes offer both master's and doctoral programs, which require one to four years of study for the master's degree and two to seven years of study for the doctoral degree.

## FACILITIES

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The College of Life Science has more than one hundred faculty members, whose research interests are deep and diverse; their research covers not only traditional basic biology but also contemporary applied biosciences.

The buildings of the College of Life Science are widely spread across the main campus of the University. They include: the Life Science Building, the Fisheries Science Building, the Biochemical Science Hall, parts of the Agricultural Chemistry Hall No. 1 and No.2, and a part of the first floor of the Agronomy building. Other facilities of the college include the Fishery Specimen Hall, Herbarium, the Culture room, three temperature-controlled research environments, student research laboratories on the 3rd, 4th and 5th floors of the Shin-Liang Hall, and the Wen-Shan Botanical Garden.

Two scientific journals, *Taiwania* and the *Acta Zoologica Taiwanica* are published periodically by the college.

## RESEARCH

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Our research focuses on molecular and cellular biology, biochemistry, biotechnology, functional genomics, proteomics, genetic engineering, and bioinformatics techniques in order to study basic morphology, physiology, metabolism, genetics, environmental adaptation and other related issues. Further, we also emphasize research in biotechnology, fish biology and tissue and cell-based research in order to meet the industrial need.

## GOALS

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Our undergraduate educational goal is to provide our students with a broad scientific background and spectrum of knowledge related to life sciences.

The educational goal for our graduate programs is to train future researchers and educators specializing in diverse of life science fields.

Our research goal is to promote collaboration between research groups in different fields and to train cross-disciplinary scientists to elevate the research standards of the University. The ultimate goal is to advance research related to the life sciences in order to support the future development of the biological industry of our country.

## CONTACT INFORMATION

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# 1. DEPARTMENT OF LIFE SCIENCES

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## INTRODUCTION

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Developments in life science (or bioscience) have made essential contributions to human life during the past two decades. It's expected that the applications of biotechnology will pave the way for the next industrial revolution. Advances in the fields of medicine and agriculture should relieve human suffering from diseases and food shortages. It is expected that advances in life science research will enhance ecological conservation, which will ensure a better quality of life for future generations.

Recent trends in modern biological science have broken up the traditional disciplines of biology, such as general zoology, botany, entomology and fishery science, and restructured them into new disciplines, including molecular biology, cytology, physiology, ecology and evolutionary biology. Our country is zealously encouraging fundamental research in modern biological science as a key direction for development. This effort includes genomic research, biotechnology, cellular differentiation, embryo development, neuroscience & behavior science, adverse-circumstance physiology, ecology and conservation biology.

Following the footsteps of reorganization and revolutionary trends at other famous foreign universities, the College of Life Sciences was established in 2003 from the reorganization of former Departments of Zoology and Botany, and Institute of Fishery Science. The College of Life Science also includes five graduate institutes: the Institutes of Zoology, Plant Biology, Fishery Science, Molecular & Cell Biology, and Ecology & Evolutionary Biology. These institutes provide major research and teaching task forces for the new department.

The department of Life Sciences has its origin in the division of Zoology and Botany of the Taihoku Imperial University during the Japanese Occupation in the late 19th and early 20th century. The university was renamed as National Taiwan University in 1945 after the retrocession of Taiwan to the Chinese Nationalist government. In the meantime, the former divisions were restructured into the departments of Zoology and Botany. The Department of Zoology was separated into the divisions of Zoological Biology and Fishery Biology in 1954, and the Graduate Institute of Fishery Science was established in 1986.



The faculty members have excellent teaching and research records. Their areas of research and teaching include both traditional & modern biology.

The educational goals of the department of life science are to train students in the fundamentals of life sciences. We balance each fields of modern life sciences, such as molecular biology, genomics, cell biology, neurobiology, biological system modeling, and theoretical ecology. We have also hired several accomplished young scholars to keep up with the rapid development of the modern life sciences. Our goals are to promote collaboration between research groups in different fields and to train cross-discipline scientists to elevate the research standards of the University. In brief, the education goals of our department are to advance research in life sciences in order to support the future development of the biological industry of our country.

## FACULTY

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Full-time: 64

Part-time:4

Ph. D. Degree: 65

M. S. Degree: 2

### Chair/ Professor

Jiun-Hong Chen      Ph.D., Oregon State  
University.

### Full-Time

#### Professor

Andrew H.-J. Wang	Ph.D., University of Illinois, U.S.A.
Tung-Tien Sun	Ph.D., University of California, Davis, U.S.A.
Shiu-Nan Chen	Ph.D., Liverpool University, U. K.
Wann-Nian Tzeng	Ph.D., University of Tokyo, Japan
Chu-Fang Lo	Ph.D., University of Tokyo, Japan
Kuo-Chieh Ho	Ph.D., University of North Carolina, U.S.A.
Huai-Jan Tsai	Ph.D., Oregon State University, U.S.A.
Tai-Sheng Chiu	Ph.D., Oregon State University, U.S.A.
Chen-Tung Yen	Ph.D., Thomas Jefferson University, U.S.A.
Su-Hwa Chen	Ph.D., University of Gottingen, Germany.
Yen-Lin Song	Ph.D., Oregon State University, U.S.A.
Hung-Non Chou	Ph.D., University of Rhode Island, U.S.A.
Chang-Fu Hsieh	Ph.D., NTU.
Lien-Siang Chou	Ph.D., University of California, Davis, U.S.A.
Ling-Long Huang	Ph.D., University of Bonn, Germany

His-Yuan Yang	Ph.D., Northwestern University, U.S.A.	Wen-Liang Liao	Ph.D., University of Tokyo, U.S.A.
Kai-Wun Yeh	Ph.D., NTU.	Ying-Chou Lee	Ph.D., NTU.
Tsan-Piao Lin	Ph.D., Oregon State University, U.S.A.	Fon-Chun Ke	Ph.D., University of Illinois, U.S.A.
Hon-Tsen Yu	Ph.D., University of California, Berkeley, U.S.A.	His-Jen Tao	B.A., National Taiwan Normal University.
Shih-Tong Jeng	Ph.D., University of Illinois, U.S.A.	Hsin-Yu Lee	Ph.D., University of California, San Francisco, U.S.A.
Shau-Chi Chi	Ph.D., NTU.	Ming-Yuan Min	Ph.D., University of Leeds, U.K.
Ling-Ling Lee	Ph.D., University of California, Davis, U.S.A.	Hsueh-Fen Juan	Ph.D., NTU.
Hsiu-Hui Shih	Ph.D., NTU.	Chau-Ti Ting	Ph.D., NTU.
Pei-Fen Lee	Ph.D., University of Michigan, U.S.A.	Wei-Pang Huang	Ph.D., University of California, Davis, U.S.A.
Yi-Chun Wu	Ph.D., Massachusetts Institute of Technology, U.S.A.	Shyh-Jye Lee	Ph.D., Iowa State University, U.S.A.
Wen-Yuan Kao	Ph.D., University of Maryland, U.S.A.	Hsu-Liang Hsieh	Ph.D., University of Texas, Austin, U.S.A.
Fon-Jou Hsieh	B.A., NTU.	Jer-Ming Hu	Ph.D., University of California, Davis, U.S.A.
Ming-Kuang Wang	Ph.D., Rutgers University, U.S.A.	Chien-Yuan Pan	Ph.D., National Yang-Ming University
Yen-Jen Oyang	Ph.D., Stanford University, U.S.A.	Keqiang Wu	Ph.D., University of Saskatchewan, Canada.
Ji-Wang Chern	Ph.D., University of Michigan, U.S.A.		
Eric Y. Chuang	Ph.D., Harvard University, U.S.A.	<b>Assistant Professor</b>	
<b>Associate Professor</b>		Reui-Feng Chen	Ph.D., NTU.
Shue-Mei Wang	Ph.D., University of South Carolina, U.S.A.	Kuei-Shu Tung	Ph.D., Pennsylvania State University, U.S.A.
Show-Wan Lou	Ph.D., University of Tokyo, U.S.A.	Tsung-Luo Jinn	Ph.D., NTU.
		Yu-The Lin	Ph.D., University of Illinois, U.S.A.

Chun-Neng Wang	Ph.D., University of Edinburgh, U.K.
Yi-Sheng Cheng	Ph.D., National Defense Medical Center.
Laurent Zimmerli	Ph.D., University of Fribourg, Switzerland
Chiu-Ping Cheng	Ph.D., University of Minnesota, U.S.A.
Chih-Tien Wang	Ph.D., University of Wisconsin-Madison, U.S.A.
Yu-Shan Han	Ph.D., NTU.
Ing-Feng Chang	Ph.D., University of California, Riverside, U.S.A.
Chia-Ying Chu	Ph.D., University of Massachusetts

**Lecturer**

Fun-Ming Lee	M.S., NTU.
Siang-Jiuun Chen	Ph.D., NTU.

**Part-time****Professor**

Yao-Sung Lin	Ph.D., Cornell University, U.S.A.
Yung-Ruei Chen	Ph.D., Michigan State University, U.S.A.
Jinn-Der Wen	Ph.D., University of Texas, Dallas, U.S.A.

**Lecturer**

Shio-Wei Huang	Ph.D., NTU.
Shao-Fan Lu	M.S., University of Washington

**FACILITIES**

The twelve-floor, 100,000 sq. foot Life Science Building is located on the main campus of the university. The facilities of the department are located throughout the entire building, except for part of the first floor and the entire second floor, which is shared with the College Entrance Examination Center. The department facilities include fifty six individual research laboratories, incubation rooms, animal culture rooms, six general teaching laboratories, and specimen collecting and display centers for animals, plants and fishes.

The major research equipment of the department includes: SEM, TEM, fluorescent microscope, ultra thin microtometer, imaging systems, phosphoimager, flow cytometer, micro-injector, electropotator, ELISA plate reader, HPLC, GC, Infrared detector, real-time PCR, automatic DNA sequencer, DNA sequence analytic system, spectrophotometer, LKB computerized analyzer, cold rooms, radioisotope detector, artificial climate control room and incubators, respiration analyzer, autoclave, fermentator, ultrasonicator, lyophilizer, cell and tissue culture facilities, fluorimeter, atomic analyzer, GPS, long range image detection and analyzing system, and geographic information system.

Most of the book collections and specialized journals subscribed to by the department are in the main NTU Library and open to the public. The department also has multiple teaching videotapes,

DVDs and software collections to facilitate teaching in the department.

## COURSES

The Department offers a four-year program leading to the degree of the Bachelor of Science majoring in Life Science. The Bachelor's degree requires a minimum of 128 credits and includes following courses:

### 1. Common required courses for all groups

General Biology and Lab. (6,2), Calculus(6), General Chemistry and Lab. (3,1), Analytical Chemistry and Lab. (3,1), Organic Chemistry and Lab (3,1), General Physics and Lab. (6,2), Biochemistry(4), Biometry(3), Cell Biology(3), Genetics(3), Biological Technology Core Lab. (4), Seminar(2).

### 2. Core courses

(18 credits are required, at least 1 course from each group)

#### A Group:

Animal Physiology(3), Plant Physiology(3),

#### B Group:

Molecular Biology(4), Genomics(3), Bioinformatics(3), Developmental Biology(3)

#### C Group:

Animal Histology(3), Comparative Anatomy of Vertebrates(2), Plant Anatomy(3), Animal Physiology(3), Plant Physiology(3), Aquatic Physiology (3), Immunology (4)

#### D Group:

Microbiology(3), Vertebrate Zoology (3), Invertebrate Zoology (3), Biodiversity of Fishes (3), The Flora and Vegetation of Taiwan(3), Plant Diversity (3).

#### E Group:

Population Biology(3), Evolutionary Biology(3), Systematics(2), Oceanography(3), Fishery Biology (3), Aquaculture(3)

### 3. Technique and laboratory

(Minimum requirement four courses four credits)  
 Zoological Technique (3), Plant Science Technique (3), Aquatic Biological Technique (3), Bioinformatics: Database(3), Biochemistry Lab. (1), Cell Biology Lab.(1), Developmental Biology Lab.(1), Genetics Lab. (1), Animal Histology Lab. (1), Comparative Anatomy Lab.(1), Plant Anatomy Lab.(1), Animal Physiology Lab.(1), Plant Physiology Lab.(1), Microbiology Lab.(1), Vertebrate Zoology Lab.(1), Invertebrate Zoology Lab.(1), The Flora and Vegetation of Taiwan Lab.(1), Plant Diversity Lab.(1), Ecology Lab.(1), Undergraduate Research in Life Science (1), Bachelor Thesis (1).

## ACADEMIC ACTIVITIES

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The Department of Life Science aims to arrange a curriculum and a spectrum of courses, and to provide educational guidelines for students who are interested in the field of life sciences. We provide diverse educational resources for students. The developmental directions of this department are expressed in professional guidelines given to the students when they are choosing their courses. The professional courses are divided into five major academic groups, including Molecular & Cellular Biology, Zoological Science, Botanical Science, Biology of Aquatic Organisms, and Evolution & Ecology. In addition, we offer an undergraduate advising system to help our students chart out their learning careers.

Various seminars and international academic symposia are frequently organized covering various fields of life science. We also publish three academic journals annually, including *Acta Zoologica Taiwanica*, *Fish Disease Research*, and *Taiwania*. In addition, a database and information retrieval system of endemic species and their life histories is under constructions in collaboration with the Agricultural Commission.

## CAREERS AND FURTHER STUDIES

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1. Professional abilities  
Basic life sciences: molecular biology, cell biology, morphology, physiology, development, systematics, evolution, behavior and ecology.  
Applied biology: conservation, bio-diversity, biotechnology, marine biology.
2. Further studies Zoology, plant sciences, biology, biochemistry and molecular biology, molecular and cell biology, microbiology, immunology, natural resources, ecology, ecology and evolution, fish sciences, oceanography, life sciences, medicine.
3. Career options High school biology teachers, researcher or technician devoted to life science, biotechnology, conservation, environmental protection, marine biology, agriculture or aquaculture, civil servant or researcher in government.

## CONTACT INFORMATION

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## 2. DEPARTMENT OF BIOCHEMICAL SCIENCE AND TECHNOLOGY

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### INTRODUCTION

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The Department of Biochemical Science and Technology was founded in 2003, as part of the newly established College of Life Science, on the initiative of the Division of Agricultural Production in the Department of Agricultural Chemistry. The matriculation of first year students commenced from 2003. The Department pursues excellence in preparing students for future careers in academic research or the application of biotechnology in industry. The graduates are expected to be equipped with strong backgrounds in Biology and Chemistry and to be prepared to meet the ever-increasing challenges in the fields of basic research and scientific discovery. Also, the graduates are expected to know how to transform their knowledge to practical applications in the development of biotech value-added products. To achieve these two goals, we design our courses to provide both extensive basic knowledge and intensive experiments.

The research conducted in the department covers a wide range, including biochemistry, molecular biology, biotechnology, microbiology, bio-industry, fermentation, food science and nutrition. The members of the faculty are dedicated, not only to

teaching, but also to conducting fruitful research. The Department won a special position among peer departments in Taiwan for the following outstanding features in its approach to teaching: First, the Department emphasizes both Biology and Chemistry. Second, the Department coordinates basic research and practical applications. And third, all the living systems, animal, plant and microorganism, are employed in teaching and training.

The Department expects to develop in the following areas: (1) Research in functional genomics, biochemical metabolism, gene regulation and basic microbiology and molecular biology; (2) Utilization of microorganisms and eukaryotes as tools for the production of biotech value-added products; (3) Evaluation the practical usefulness of biotechnological products. (4) Development of the processes for industrialized biotech products. In facing the emerging fields of biochemical science and technology in the new era, the Department is committed to forming a strong partnership with bio-industry to push Taiwan steady, healthy economic growth. In the meantime, the department will pursue excellence in research to form a beneficial interaction between research and application.

## FACULTY

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The department comprises of 36 academic staffs, where 36 of them hold Ph.D. degree.

Professor Emeritus: 7

Full-time: 29 (Adjunct Faculty:5, Part-time:1)

Ph.D.: 36

### Chair/ Professor

Tzu-Ming Pan Ph.D., NTU.

### Professor Emeritus

His-Hua Wang Ph.D., Hokkaido University, Japan

Wei-Hsien Chang Ph.D., Michigan State Univ., USA

Jong-Ching Su Ph.D., University of California, Berkeley, USA

Yuang-Chi Su Ph.D., University of Tokyo, Japan

Liang-Ping Lin Ph.D., Louisiana State Univ., USA

Hsien-Yi Sung Ph.D., NTU

Wen-Hsiung Liu Ph.D., University of Tokyo, Japan

### Full-Time

#### Professor

Ping-Du Lee Ph.D., NTU.

Ching-Jang Huang Ph.D., NTU

Rong-Huay Juang Ph.D., NTU.

Jan-Hsiung Huang Ph.D., NTU.

Ning-Sing Shaw Ph.D., Cornell University, USA

Chien-Yuan Chen Ph.D., NTU.

Bi-Fong Lin Ph.D., University of California, Berkeley, USA

Ruey-Shyang Hseu Ph.D., NTU.

Ai-Yu Wang Ph.D., NTU.

Ching-Tsan Huang Ph.D., Duke University, USA

Hsi-Mei Lai Ph.D., University of Illinois, USA

Andrew H,-J.Wang Ph.D., University of Illinois at Urbana Champaign, USA

#### Associate Professor

Chung-Ming Liou Ph.D., University of Tokyo, Japan

Kung-Ta Lee Ph.D., University of Tokyo, Japan

Whi-Fin Wu Ph.D., University of Iowa, USA

Nan-Wei Su Ph.D., NTU.

#### Assistant Professor

Chien-Chih Yang Ph.D., University of Cambridge, UK

Chii-Shen Yang Ph.D., University of Illinois, USA

Chun-Jen Chen Ph.D., University of Texas at Austin, USA

Li-Kwan Chang Ph.D., Chang-Gung University.

Shih-Chung Chang Ph.D., NTU

Feng-Ting Huang Ph.D., University of Southern California, USA

### Adjunct Faculty

#### Professor

Lin-Fen Shyur Ph.D., NTU



**Associate Professor**

- Chin-Tin Chen Ph.D., University of Kentucky, USA
- Yee-Yung Charng Ph.D., University of Michigan State, USA

**Assistant Professor**

- Kuo-Kan Liang Ph.D., NTU
- Wei-Hau Chang Ph.D., Stanford University, USA

**Part-Time****Professor**

- Wen-Chang Chang Ph.D., NTU

**FACILITIES**

The department is located mainly in the new and old (Building 3) Agricultural Chemistry buildings. A number of microbiology laboratories are located on the first floor and basement of the Agronomy Building. In addition to the department office and meeting room, shared core facility laboratories, five shared classrooms and four student laboratories, each staff member has an independent laboratory. The department is equipped with modern research equipment, such as peptide synthesizer, monoclonal antibody production laboratory, real time-PCR, thermal cyclers for PCR, capillary electrophoretic system, ultracentrifuges, HPLC, 96-well reader for luminescence, fluorescence, UV and visible spectrometer, UV-vis spectrophotometers, fluorometers, fraction collectors, jar fermentors with microprocessor, image analyzers, beta-counters, microscope with fluo-

roscopetro-system, various electrophoretic systems, freeze dryers, electroporator, mammalian cell culture lab., plant cell culture lab., lab animal room and related facility, transmission and scanning electron microscope, X-ray diffraction system, Flow Cytometry etc.

**COURSES**

Besides the basic requirements, students can select courses from a range of required categories of courses, based on their interests and capabilities.

1. Absolute required courses: Calculus B (3,3), General Chemistry C(3), General Chemistry Lab(1), General Physics B(3, 3), General Physics Lab(1,1), General Biology (2,2), General Biology Lab(1,1), Organic Chemistry(3), Organic Chemistry Lab(1), Analytical Chemistry B(2,2), Analytical Chemistry Lab(1,1), Biochemistry(4,4), Biochemistry Lab(2), Physical Biochemistry(2,2), Microbiology (2,2), Microbiology Lab (2), Molecular Biology(4), Core course of Biotechnology Lab(4), Seminar I,II(1,1), Introduction To Biochemical Science and Technology(1)
2. Elective required courses: This segment of required courses is divided into four categories including: microbiology, biochemistry, structure biology and others. Students are required to take at least one course from each category.
  - (a) Microbiological Science and Technology:

Applied Microbiology(3), Applied Microbiology Lab (2), Microbial Genetics(2), Microbial Metabolism(2), Immunology(2), Virology(3).

(b) Biochemistry: Principles of Biochemical Technology(2), Nutritional Biochemistry (2), Nutritional Biochemistry Lab(2), Hormones and Regulators (2), Clinical Biochemistry(2), Plant Secondary Metabolism(2), Biomolecular Kinetis(2)

(c) Structure Biology: Molecular Biophysics(2), Proteomics (2), Protein structure and function (2), Bioinformatics (2), Introduction to Structural Biology(2).

(d) Others: Biometrics(3), Genetics(3), Bioorganic chemistry(2), Chemical analysis of Biomaterials(2,2), Chemical analysis of Biomaterials Lab(1), Cell Biology(3)

## ACADEMIC ACTIVITIES

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International and local scientists in related fields are invited to give academic seminars. Symposia on focal issues are held for the enhancement of research and development. Staff, faculty and students regularly attend meetings and symposia of international and local academic societies of related fields, including: biochemistry and molecular biology, biotechnology, microbiology, nutrition and food science.

## CONTACT INFORMATION

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# 3. GRADUATE INSTITUTE OF ZOOLOGY

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## INTRODUCTION

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The Graduate Institute of Zoology is the continuation of the graduate section of the former Department of Zoology. The Department of Zoology was founded in 1945. The M.S. program and Ph.D. program were established in 1960 and 1985, respectively. After the reorganization of the Department of Life Science, the Graduate Institute of Zoology became an independent graduate institute in 2003. Nevertheless, the Graduate Institute of Zoology remains tightly connected with the Department of Life Science in sharing teaching resources and lab space.

The mission of the Graduate Institute of Zoology is to train modern zoologists. We offer training in a wide spectrum of fields in fundamental zoology and applied zoology. All full-time and adjunct professors are organized into two groups: (1) Life Sciences, (2) Neurobiology.

## FACULTY

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Full-time: 17

Part-time: 11

Ph.D. Degree: 24

M.S. Degree: 0

### Director/ Professor

Jiun-Hong Chen      Ph.D., Oregon State University, U.S.A.

### Full-time

#### Professor

Hon-Tsen Yu      Ph.D., University of California, Berkeley, U.S.A.

Chen-Tung Yen      Ph.D., Thomas Jefferson University, U.S.A.

Chu-Fang Lo      Ph.D., University of Tokyo, Japan

Tai-Sheng Chiu      Ph.D., Oregon State University, U.S.A.

Yen-Lin Song      Ph.D., Oregon State University, U.S.A.

Shau-Chi Chi      Ph.D., NTU

Hsiu-Hui Shi      Ph.D., NTU

Hsin-Yu Lee      Ph.D., University of California, San Francisco, U.S.A.

**Associate Professor**

- Wei-Pang Huang Ph.D., University of California, Davis, U.S.A.
- Ming-Yuan Min Ph.D., University of Leeds, U.K.
- Hsi-Jen Tao B.A., National Taiwan Normal University
- Chau-Ti Ting Ph.D., NTU
- Chien-Yuan Pan Ph.D., National Yang-Ming University
- Shyh-Jye Lee Ph.D., Iowa State University, U.S.A.

**Assistant Professor**

- Ruei-Feng Chen Ph.D., NTU
- Chia-Ying Chu Ph.D., University of Massachusetts, Worcester, U.S.A.

**Part-time****Professor**

- Shih-Chieh Shen Ph.D., University of Tokyo, Japan
- Tien-Hsi Tan B.A., NTU
- Nin-Nin Chuang Ph.D., Cambridge University, U.K.
- I-Chiu Liao Ph.D., University of Tokyo, Japan
- Guang-Hsiung Kou Ph.D., University of Tokyo, Japan
- Chyung-Ru Wang Ph.D., University of Texas, Austin, TX, U.S.A.
- Wei-Jen Tang Ph.D., University of Texas, Austin, TX, U.S.A.

- Tohru Yoshioka Ph.D., Hokkaido University, Japan.

**Assistant Professor**

- Chin-Cheng Chen Ph.D., University College London, U.K.
- Yung-Feng Liao Ph.D., University of Georgia, U.S.A.
- Wen-Chin Yang Ph.D., University of the Mediterranean, France

## FACILITIES

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The Graduate Institute of Zoology is located in the Life Science Building, which is shared with the Department of Life Science, the Graduate Institute of Plant Science, the Graduate Institute of Molecular and Cell Biology, the Graduate Institute of Ecology and Evolutionary Biology, and the College Entrance Examination Center. The animal collection accumulated over the years is open for public viewing on the 1st floor of the east side of the building. In addition, the Institute is in charge of animal rooms, cell biology lab., and an isotope lab., all on the 1st floor. All of the lecture rooms, administration offices and laboratories are located from the 4th floor to the 8th floor. On the 4th floor, there are three lecture rooms and seven teaching laboratories. The administrative office of the Institute and the labs of systematic zoology are located on the 5th floor. Laboratories of environmental studies and related subjects, including ecology and fishery biology, are situated on the 6th floor. The laboratories on the 7th floor are for the fields of morphology and functional biology, including cell biology, physiology, and neurobiology. The laboratories of molecular biology and fish pathology are situated in the 8th floor.

The Institute has excellent facilities and equipment needed for teaching and research. Major research and teaching equipment include scanning and transmission electron microscopes, confocal microscopes, a variety of light microscopes, flow cytometer, ultramicrotomes, spectrophotometers, DNA sequencer, etc. The Institute also runs a freshwater aquarium, several fish ponds, and maintains a fish collection with more than 7,000 specimens.

## COURSES

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The Graduate Institute offers a 1 to 4 year program leading to the degree of Master of Science in Zoology. The master degree requires a minimum of 30 graduate credits, which include six credits of Master thesis. The Institute also offers a 3 to 7 years program leading to the Doctor of Philosophy degree in Zoology. The requirements for the Ph.D. degree include 18 graduate credits and 12 credits of dissertation. Students must finish the qualifying examination by the end of their third year.

## ACADEMIC ACTIVITIES

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In order to raise the academic standard and strengthen international cooperations, the Graduate Institute has sponsored many international symposia, such as aquaculture diseases, neurobiology, biotechnology, etc.

Research fields of the faculty not only emphasize on basic biology but also practical application of biological knowledge. In basic biology, faculty members are studying molecular evolution, molecular systematics, genomics of virus, cellular endocrinology, cell recognition and communication, developmental biology, neurobiology, neurophysiology, etc. In applied fields, two strong research teams, i.e., the fish disease group and the shrimp genome group are currently studying prevention and treatment of fish disease, aquaculture, and conservation of natural resources.

## CONTACT INFORMATION

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# 4. GRADUATE INSTITUTE OF PLANT BIOLOGY

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## INTRODUCTION

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Department of Botany was affiliated with the College of Science and Agriculture when Taihoku (Taipei) Imperial University was established in 1928. After World War II, Taihoku Imperial University was reorganized and renamed as National Taiwan University. The Master and the Ph.D. programs of the Botany Department were initiated in 1947 and 1973, respectively. When College of Life Science was established in 2003, Department of Botany and Department of Zoology were merged as Department of Life Science. The Institute of Plant Biology was thereafter established, providing Master and Ph.D. programs for prospective graduate students.

This Institute focuses on plant biology research using modern molecular biological techniques. We offer diversified courses such as molecular biology, genetics, cell biology, transgenic techniques, and plant-microbe interaction. Our research in plant biology consists of the following categories: plant physiology, stress physiology, signal transduction, microbiology, macromolecule structure, and biotechnology. Research in the Institute can be divided into the following topics:

1. Exploitation of useful genes
2. Plant stress biology
3. Regulation of growth and development
4. Development and application of transgenic plants

## FACULTY

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Full-time: 15

Part-time: 9

Ph.D. Degree: 22

M.S. Degree: 2

### Director/ Professor

Kai-Wun Yeh                      Ph.D., NTU, Taiwan

### Full-Time

#### Professor

Tsan-Piao Lin                      Ph.D., Oregon State Univ., USA

Shih-Tong Jeng                      Ph.D, Univ., Illinois, USA

Kuo-Chieh Ho                      Ph.D., Univ., North Carolina at Chapel Hill, USA

Ning-Sun Yang                      Ph.D., Michigan State Univ., USA

#### Associate Professor

Shue-Mei Wang                      Ph.D., Univ., South Carolina, USA



Keqiang Wu Ph.D., Univ., Saskatchewan,  
Canada

Hsu-Liang Hsieh Ph.D., University of Texas,  
USA

Chiu-Ping Cheng Ph.D., University of Min-  
nesota, USA

#### Assistant Professor

Tsung-Luo Jinn Ph.D., NTU

Laurent Zimmerli Ph.D., Univ. of Fribourg,  
Switzerland

Yi-Sheng Cheng Ph.D., National Defense  
Medical Center, Taiwan

Ing-Feng Chang Ph.D., Univ., California,  
USA

#### Lecturer

Fen-Ming Lee M.S, NTU, Taiwan

#### Part-Time

#### Professor

Chu-Yung Lin Ph.D., University of Okla-  
homa, USA

Chi-Ying Huang Ph.D., University of Illinois,  
USA

Bai-Lin Lin Ph.D., Ohio State Univer-  
sity, USA

Chia-Yin Tsai Ph.D., Purdue University,  
USA

Chih-Sheng Tsou Ph.D., University of Amster-  
dam, Netherlands.

Yih-Ming Chen M.S., NTU, Taiwan

Ching-Te Chien Ph.D., Univ. Idaho, USA

San-San Tsay Ph.D., Univ., Oklahoma  
state, U.S.A.

#### Associate Professor

Ming-Tsair Chan Ph.D., NTU, Taiwan

## FACILITIES

Research laboratories in our institute are located on the 9th, 10th and 11th floors of the Life Science Building. There are core facilities available on each of these floors. Two isotope laboratories are located on the 9th and 10th floors. We are well equipped with various instruments, such as DNA microarray system, two-photon confocal microscope, SEM, TEM, real-time PCR, ProteomeLab PF 2D, Las 3000, Typhoon 9400 Imager, fluorescent dissecting microscope, ultracentrifuge, GC-MS, Dionex HPLC, etc.

## COURSES

### MasterDegree

This is a 2 to 4 year program. All graduate students should finish 24 credits including a thesis for the degree. Seminar (4 credits), research training (4 credits), are required.

### Ph.D. Degree

This is a 3 to 7 years program. All graduate students should finish 18 credits, pass the preliminary examination for qualification, complete the doctoral dissertation and publish one paper in international journals at a high ranking. Seminar (6 credits), research training (6 credits) are required.

## ACADEMIC ACTIVITIES

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Internationally known scientists were invited to present their researches in our institute. Symposia on various topics were held to promote the interaction in our research community. International students, postdoctoral fellows and visiting scholars are welcome to join our Institute.

## CONTACT INFORMATION

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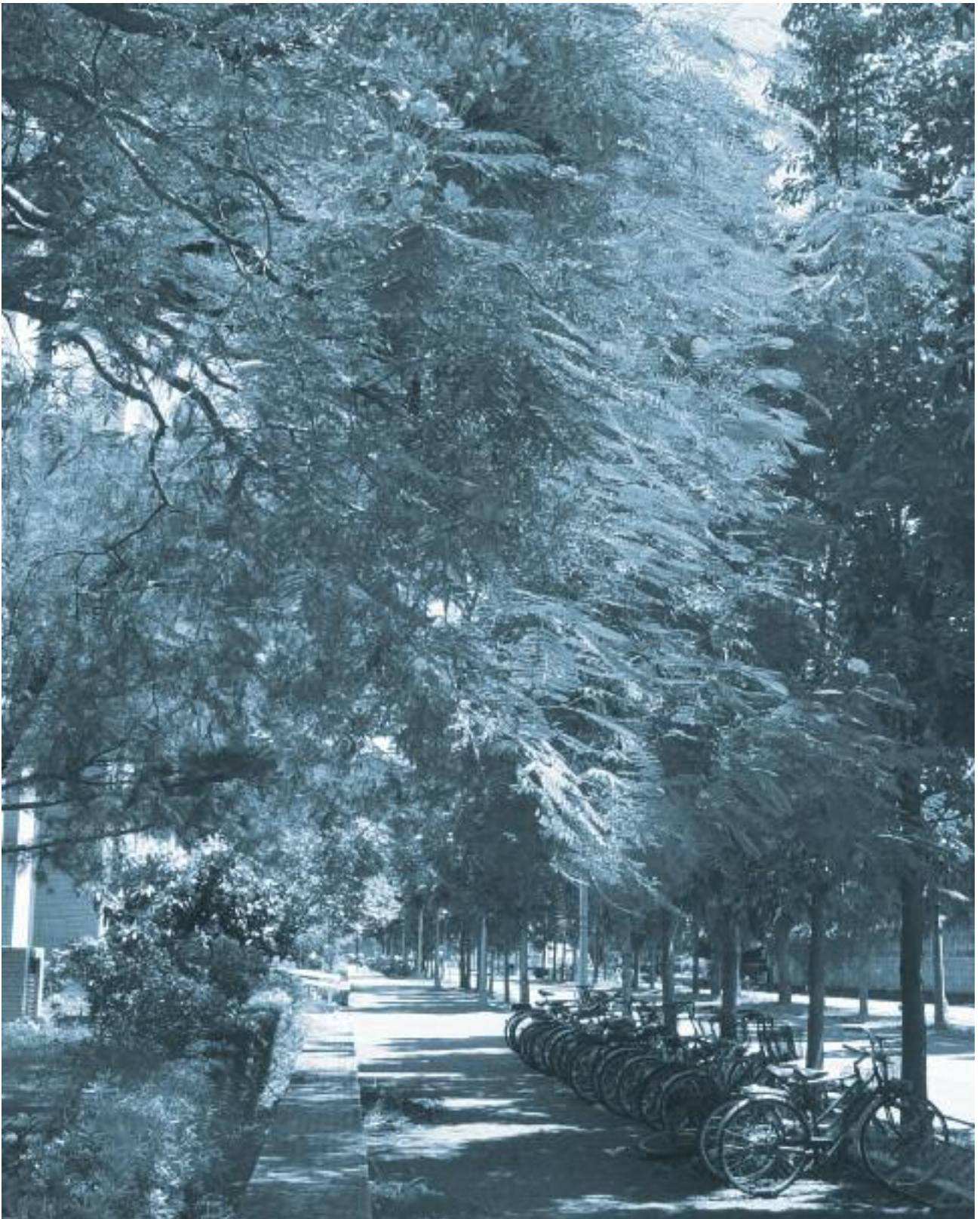
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# 5. GRADUATE INSTITUTE OF MOLECULAR AND CELLULAR BIOLOGY

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## INTRODUCTION

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As an inaugural member of the College of Life Science, the Institute of Molecular and Cellular Biology faculty is specialized in the fields of molecular biology, cell biology, genetics, and developmental biology. We use various model organisms, such as Yeast, *C. elegans*, *Drosophila*, and Zebrafish *Arabidopsis*, to study the structure and function of genes and cells, the mechanisms of inheritance and development, and the structural and functional genomics of these organisms. The faculty members are also responsible for teaching related courses in the Department of Life Science and the Institute. The curriculum is aimed to instruct students in the essential life science concepts, from molecular biology of the gene, to chromosome structure and function, to organization and function of cells (the fundamental subunits of life), to tissue, and finally, to the development of an individual. We also aim to stimulate the interest and increase the potential of the students in modern life sciences.

Institute goals are to train researchers and teachers in modern biology, and to provide experts and support for our country's ascendancy in the highly competitive field of life science research and development.

## FACULTY

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Full-time: 8

Part-time and Adjunct: 5

Ph.D. Degree: 13

### Director/ Professor

Huai-Jen Tsai      Ph.D., Oregon State University, U.S.A

### Full-time

#### Professor

His-Yuan Yang      Ph.D., Northwestern University, U.S.A

Yi-Chun Wu      Ph.D., Massachusetts Institute of Technology, U.S.A.

Tze-Bin Chou      Ph.D., State University of New York at Stany Brook , U.S.A.

#### Associate Professor

Fon-Chun Ke      Ph.D., University of Illinois, U.S.A.

#### Assistant Professor

Kuei-Shu Tung      Ph.D., Pennsylvania State University, U.S.A.

Chih-Tien Wang      Ph.D., University of Wisconsin-Madison, U.S.A.

Jin-Der Wen      Ph.D., University of Texas at Dallas, U.S.A.

## Part-time

### Professor

Fore-Lien Huang	Ph.D., University of Windsor, Canada
Yung-Reui Chen	Ph.D., Michigan state University, U.S.A.
Hsou-Min Li	Ph.D., University of Wisconsin-Madison, U.S.A.
Yi-Fang Tsay	Ph.D., Carnegie-Mellon University, U.S.A.

## Adjunct

### Professor

Xue-Fan Ruan	Ph.D., NTU
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## FACILITIES

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The administration office, faculty office and laboratories are located in the Life Science Building on the main campus. Conference rooms, discussion rooms, classrooms, and student laboratories are also located in the Life Science Building, and are maintained by the Department of Life Science. The institute has excellent facilities and equipment for teaching and research, including: scanning and transmission electron microscopes, confocal microscope, fluorescence and other various microscopes, ultracentrifuges, spectrophotometers, PCR machines, gene transfer equipment, flow cytometer, etc.

## COURSES

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The institute offers programs leading to the M.S. and Ph.D. degrees. The M.S. degree requires a minimum of 24 graduate credits and 6 credits of thesis. The Ph.D. degree requires 18 graduate credits and 12 credits of thesis. Molecular Cell Biology (3) is required for students of both the master and Ph.D. programs. Other courses offered by the programs include: Cytogenetics, Molecular Genetics, Gene and Development, Cell Cycle, Cytoskeleton and Matrix, Developmental Biology, Special topics on Molecular Biology, Microscopy, Molecular Developmental Biology, Cellular Signal Transduction, Genomics, Protein Structure and Function, Structural Biology, Bioinformatics, Virology,



Immunology, Gene Technology, Marine Molecular Biology and Biotechnology etc.

## ACADEMIC ACTIVITIES

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1. Weekly seminar by invited speakers.
2. Frequent workshops and conferences in Molecular and Cellular Biology.

## CONTACT INFORMATION

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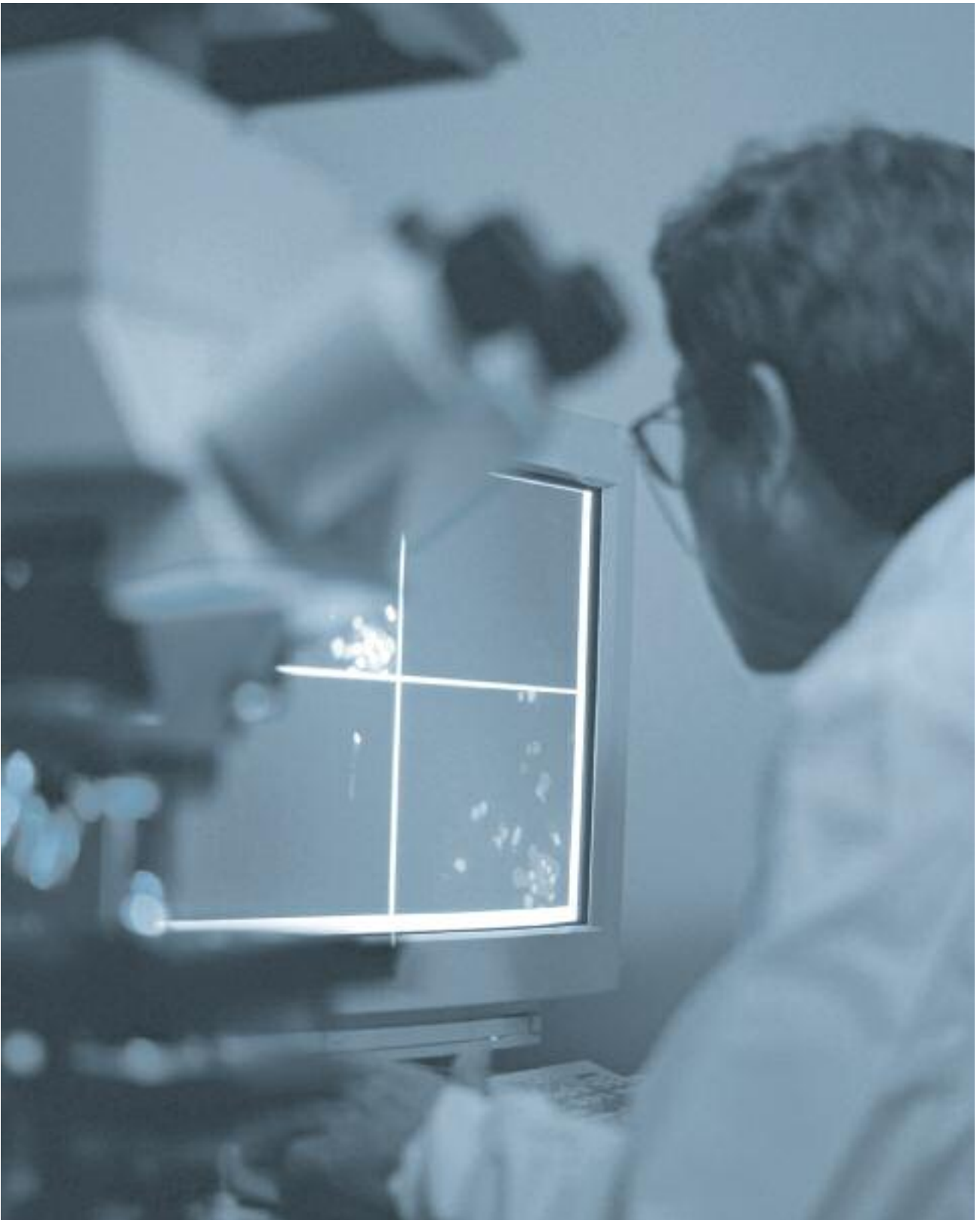
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# 6. GRADUATE INSTITUTE OF ECOLOGY AND EVOLUTIONARY BIOLOGY

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## INTRODUCTION

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In response to the growing need for biodiversity conservation and sustainability, NTU reorganized the Department of Zoology and the Department of Botany into the Institute of Ecology and Evolutionary Biology in 2003. The aims are to provide the best education program in this field to graduate students, and to serve as the best research integration for biodiversity research in Taiwan.

We now have 21 faculty, and approximately 90 graduate students and post doctorates. In addition, we plan to invite some faculty within NTU with related interests to form an integrated ecology and evolution group. Our offices and laboratories are located in the Life Science Building, but our research often takes us to various field sites in Taiwan. The Institute has four informal research foci: molecular evolution, systematics, plant ecology, and wildlife ecology. There is a great deal of interaction and collaboration within these groups, though projects often cross these boundaries as well.

Although faculty and students in the Institute study a wide range of biological problems, ecology and evolution are the central themes, and a mixing of

theory and empiricism is the style that guides us. Despite our breadth, we are deep in the areas of ecology, evolution, behavior and biodiversity. Many of the research projects are interdisciplinary and have resulted in strong links to the other institutes of Molecular and Cell Biology, Zoology, Plant Science and Fishery Sciences within the College of Life Science. The excitement and quality of the research that is done in the Institute creates an exceptional learning environment for graduate students.

Graduate study in the Institute leads to the M.S. and Ph.D. degrees. The special areas of strength in the institute are behavioral ecology, theoretical ecology, population and community ecology, landscape ecology, molecular evolution, and conservation biology. The interests and research of faculty range widely over these areas, and incoming students are able to select their adviser from among several professors working in the chosen discipline. Graduate students also have excellent opportunities for combining several areas for innovative interdisciplinary work.

Our graduate program is designed to develop both the breadth and depth of understanding that will enable graduates to respond to future advances in

the field. At the same time, students acquire the detailed knowledge and techniques needed to become effective scientists. Each student is guided in developing a comprehensive but flexible course of preparation that is designed to meet his or her educational needs and goals. There are only a few formal course requirements and independent research begins early.

## FACULTY

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### Director/ Professor

Pei-Fen Lee            Landscape ecology, Remote sensing and GIS

### Professor

Su-Hwa Chen            Paleoecology and climate change, Pollen biology and evolution, Pollen sterility

Lien-Siang Chou        Dolphin and whale conservation, Plant and animal coevolution

Chang-Fu Hsieh        Forest ecology, Biodiversity of vascular plants in Taiwan

Wen-Yuan Kao            Physiological ecology, Ecosystem physiology

Ling-Long Kuo-Huang    Evolutionary and ecological plant anatomy, Structure and function of the secondary plant body

Ling-Ling Lee            Ecology and behavior of Taiwan mammals, Mammal research in long-term ecological research

Jiunn-Tzong Wu        Aquatic ecology, Ecological physiology, Algae biochemistry, Water pollution and environmental indicator, Paleolimnology

### Associate Professor

Jer-Ming Hu            Plant molecular evolution, Systematic taxonomy, Developmental evolution of flowers

Chau-Ti Ting            Genetics of speciation, Population genomics

### Assistant Professor

Yu-Te Lin                Landscape ecology, Theoretical ecology, Small mammal ecology

Chun-Neng Wang        Flower morphogenesis, Developmental evolutionary genetics, Reproductive and pollination biology, Population biology, Conservation, Biodiversity

Chih-Hao Hsieh        Statistics, Theoretical ecology, zooplankton ecology, biological oceanography, fisheries.

**Instructor**

Shiang-Jiuun Chen Plant Anatomy, Plant  
Microtechnique, Biological  
Electron Microscopy.

**Adjunct Professor**

Yao-Sung Lin Biodiversity research, Wildlife  
ecology

Lucia Liu Severinghaus

Avian ecology and behavior,  
Avian biogeography,  
Biodiversity, Integrative  
aspect of natural resources  
conservation

Yu-Ming Ju Systematic studies on  
pyrenomycetous fungi

**Adjunct Associate Professor**

Chen-Meng Kuo Pteridology, Phytogeogra-  
phy, Applied ecology

Shau-Ting Chiu Plant evolution, Plant eco-  
logical physiology

**Adjunct Assistant Professor**

Benny K.K. Chan Intertidal ecology and  
biogeography, supply-side  
ecology, larval biology and  
crustacean (especially bar-  
nacles) ecology

**Distinguished Chair Professor**

Chang-Hung Chou Plant physiology, Plant  
ecology, Plant chemical  
ecology

**CONTACT INFORMATION**

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# 7. INSTITUTE OF FISHERIES SCIENCE

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## INTRODUCTION

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To integrate fisheries-related teaching and research units in the campus of NTU, the Fisheries Science Research Building was constructed in 1979 with the financial support of the Council of Agriculture. Subsequently, the Institute of Fisheries Science was founded to promote the fishery and aquaculture industries by educating fisheries science and advancing new technologies. Master of science degrees in Aquaculture and Fishery Science were offered in 1986 and the Ph.D. program began in 1997. To date, , more than 300 students have completed their Masters degrees and 20 students received their Ph.D. degrees. These graduates have devoted themselves to the industry, government and academia. The advanced knowledge and the exposure to high technology these students receive enable them to make their contribution in fishery development and management in the era of the knowledge economy.

In 2003, the Institute of Fisheries Science was reorganized with the fisheries-related faculties of the Department of Zoology of the College of Science to become a member of the newly established College of Life Science. The new institute is responsible for providing basic courses for stu-

dents of the Department of Life Science of the new college, including marine life science, aquatic biology, marine fisheries ecology, aquaculture, and modern aquatic biotechnology for fish reproduction and disease control in raising fishery production. The concepts of environmental conservation and resource management are also taught to underline the need to consider the equilibrium of ecosystems. Meanwhile, innovated technologies developed in the laboratory are transferred to different marine biotech industries to improve aquaculture products, production and sustainable utilization of aquatic life resources.

In the future the Institute will continue to do its best to focus its human and capital resources on the principal tracks of (1) Marine biotechnology and molecular biology; (2) Reproductive physiology and ecology of aquatic animals; and (3) Fisheries biology and resource management.

## FACULTY

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Full-time:7

Adjunct:6

Emeritus Professor:1

Part-time:1

Ph.D. Degree:15

### Director/ Professor

Wann-Nian Tzeng    Ph.D. University of Tokyo,  
Japan

### Professor Emeritus

Ching-Ming Kuo    Ph.D. University of  
California, San Diego, USA

### Full-Time

#### Professors

Shiu-Nan Chen    Ph.D. Liverpool University,  
U.K.

Hong-Nong Chou    Ph.D. University of Rhode  
Island, U.S.A

#### Associate Professors

Show-Wan Lou    Ph.D. University of Tokyo,  
Japan

Wen-Liang Liao    Ph.D. University of Tokyo,  
Japan

Ying-Chou Lee    Ph.D. National Taiwan  
University

#### Assistant Professor

Yu-San Han    Ph.D. National Taiwan  
University

#### Adjunct Professors

Jen-Leh Wu    Ph.D. University of  
Arkansas, U.S.A

Pung-Pung Hwang    Ph.D. University of Tokyo,  
Japan

Hong-Yuong Yan    Ph.D. University of Texas at  
Austin, U.S.A.

#### Associate Professor

Chi-Yao Chang    Ph.D. National Tsing-Hua  
University

#### Assistant Professor

Chung-Yen Lin    Ph.D. National Taiwan  
University

Jyh-Yih Chen    Ph.D. National Taiwan  
University

### Part-Time

#### Professor

Hon Cheng Chen    Ph.D. Liverpool University,  
U.K.



## FACILITIES

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The Institute of Fisheries Science is located in the main campus of NTU. Fifty-six rooms of various sizes are arranged for offices, auditoriums, conference rooms, laboratories, hatcheries, greenhouse culture ponds, cold rooms, walk-in incubators, herbaria, and controlled areas for radioisotope operations and cell culture. The Institute is well equipped with facilities and instruments for culture and breeding of aquatic organisms, water quality analysis, microscopic observations, recording and transgenic operations. There are also instruments for biochemical and bioorganic analysis, such as, automatic DNA sequencer, thermocycles polymerase chain reactor, UV-Vis spectrophotometer, fluorescence spectrometer, Fourier-transform infrared spectrometer, capillary electrophoresis, high performance liquid chromatography, gas chromatography mass selective detection, and matrix assisted laser desorption ionization time of flight mass spectrometer. Facilities that house the scanning electron microscope, electron probe microanalyser and inductively coupled plasma mass spectrometer for fish ageing and otolith microchemistry are operated in collaboration with Academia Sinica and the National Cheng-Kung University.

Annually a budget of around NT\$500,000 is allocated for subscriptions to more than 16 fisheries-related journals, and NT\$100,000 for books. All the assigned journals and books are housed in the Main Library of the university and open to the public.

## COURSES

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We offer programs towards both Masters and Ph.D. degrees.

### Masters Degree:

Students in our Masters program must obtain 24 credits in addition to the thesis research (6 credits) for the Masters degree, including the prerequisite courses which are four semesters of Seminar on Fisheries Science, 1 credit each, one semester of Marine Fisheries Ecology, 2 credits, one semester of Aquaculture Technology, 2 credits. After finishing the required courses, students must submit the draft manuscript of the thesis for approval by advisory committee before application for an oral examination. Typically it takes two years (maximum of 4 years ) to be granted a Masters degree in Life Sciences.

### Ph.D. Degree:

Students in our Ph.D. program must obtain 18 course credits in addition to the 12 credits of dissertation research. Seminar courses for four semesters, 1 credit each, and Special Topics in



Fisheries Science for two semesters, 2 credits each, are required for Ph.D. students. Students who bypass the Masters defense after remaining one year in the Masters program will need 30 course credits in total before applying for the qualification examination. All students must take the qualification examination within 3 years in the program before they become a Ph.D. candidate. It is required that the Ph.D. candidate must publish two or more academic papers, in which the candidate must be the first author with the corresponding address as the Institute of Fisheries Science, NTU. Of the two published papers at least one should be on the SCI journal list. After fulfilling the above requirements and passing the dissertation examination, the candidate will be granted a Ph.D. degree in Life Sciences.

## ACADEMIC ACTIVITIES

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A weekly course of Special Topics in Fisheries Science invites prominent industrial representatives, government officials or outstanding scholars to give lectures on their expertise and special experience. This two-hour course is open to all the students and faculty members.

The Institute holds an annual contest and poster demonstration of the graduation thesis or dissertation in April.

All the students and faculty members actively participate in paper presentations and meetings at the annual

convention of the Fisheries Society of Taiwan. Our faculty members are also actively involved in board and committee activities.

Our institute keeps close contact with the Institute of Zoology and the Institute of Oceanography in our university, related departments and institutions in the National Taiwan Ocean University, National Sun Yat-Sen University, the Institute of Cellular and Organismic Biology at Academia Sinica and the Taiwan Fisheries Research Institute. Members of our faculty are encouraged to attend international conferences, engage in collaborative studies, and to apply for research funding from the National Science Council, Council of Agriculture, Fisheries Administration, Environmental Protection Administration, County governments, and the private sector, so as to have joint effort in biotechnology exploration in academia, government and industry.

## CONTACT INFORMATION

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# 8. GRADUATE INSTITUTE OF BIOCHEMICAL SCIENCES

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## INTRODUCTION

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The Institute of Biochemical Sciences was established in 1972 at the exhortation of the late Professor Cho-Ho Li, who was the Director of the Hormone Research Laboratory at the University of California, San Francisco. After his first 8-week University lectureship in 1958, Professor Li became deeply involved in the preparation of an educational and research institute to train students in the modern interdisciplinary science of Chemistry and Biology and to promote the Protein Research in Taiwan. From 1958-1971, through a process of exchange and consultation between Professor Li and the President of Academia Sinica, Minister of Education and Chairman of National Science Council, a consensus was reached to set up a joint collaborative Institute between the University and Academia Sinica. The counterpart institute was named Institute of Biological Chemistry. Both institutes maintain close collaboration in teaching and research. Since 1973 the Institute of Biochemical Sciences has attracted many undergraduates with degrees in diverse fields from various colleges and universities to pursue the Master degree (M.S.). The Institute set up its Ph.D. program in 1984 and currently has a student body of 65 M.S. and 106 Ph.D. students.

## PREVIOUS DIRECTORS

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Professors Tung-Bin Lo, Yee-Hsiung Chen, Wen-Chang Chang, Chen-Sheng Liu, Mu-Chin Tzeng, Inn-Ho Tsai, Shyh-Horng Chiou, and Wen-Chang Chang.

### Current Director

#### Professor Geen-Dong Chang.

At the time of its inception, the Institute embraced two important goals and resolutions: 1. Cultivate students with a strong background in the biochemical sciences and a perspective to open new ground in the biological sciences. 2. Train the new-generation scientists to be leaders in the biochemical sciences and technology in order to promote the emerging biotechnology in Taiwan. As its long-term objective, the Institute devotes itself to the study of biologically active proteins. It selected the biochemical characterization of snake venom proteins as the initial short-range objective, and gradually expanded and diversified to various fields in the life sciences, which include molecular and cell biology, chemical biology, glycoscience and structural biology. Over the years, the Institute has steadily expanded to include graduate students and postdoctoral fellows. The Institute recruits 30

M.S. and 15 Ph.D. students of diverse background from various colleges and universities in the country each year. Currently, the graduate programs rank highly among the peer graduate programs around the island.

The focus and emphasis of the Institute have always been on integrated basic and biotech research. The development of the Institute has emphasized five major research areas: (1) Molecular and cell biology; (2) Genomics and proteomics; (3) Chemical Biology; (4) Glycoscience; (5) Structural biology and molecular biophysics. In the coming years, the Institute will be leading the efforts to build a strong protein and proteomics program which will become an integral part of the Functional Genomics in the post-genomic era.

## FACULTY

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Full-time : 21

Part-time: 13

Ph.D. Degree : 33

M.S. Degree: 1

Currently the Institute employs 21 full-time faculty, including 13 professors, 5 associate professors, 2 assistant professors and 1 lecturer. In addition, 13 faculty members of the Institute of Biological Chemistry, Academia Sinica, are available to support teaching and research.

### Director/ Professor

Geen-Dong Chang Ph.D., University of Illinois at Urbana Champaign, U.S.A.

### Full-time

#### Professor

Yee-Hsiung Chen Ph.D., University of California, San Francisco, U.S.A.

Shyh-Horng Chiou Ph.D., Colorado State Univ., U.S.A.

Inn-Ho Tsai Ph.D., Northwestern Univ., U.S.A.

Shih-Hsiung Wu Ph.D., University of Wisconsin, U.S.A.

Wen-Chang Chang Ph.D., NTU

Andrew Hwai-Jiung Wang  
Ph.D., University of Illinois at Urbana Champaign, U.S.A.

Shui-Tein Chen Ph.D., NTU

Chi-Huey Wong Ph. D., Massachusetts  
Institute of Technology,  
U.S.A.

Chang-Jen Huang Ph.D., NTU.

Po-Huang Liang Ph.D., University of  
Maryland, U.S.A.

Ruey-Hwa Chen Ph.D., Michigan State  
University, U.S.A.

Ming-Daw Tsai Ph.D., Purdue University,  
U.S.A.

Chun-Hung-Lin Ph.D., Scripps Research  
Institute, U.S.A.

Lung-Chih Yu Ph.D., NTU

#### Associate Professor

Chia-Lam Kuo Ph.D., California Institute of  
Technology, U.S.A.

Sin-Tak Chu Ph.D., NTU

Ming-Ting Lee Ph.D., Auburn University,  
U.S.A.

Hungwen Chen Ph.D., University of Florida,  
U.S.A.

Ching-Jin Chang Ph.D., NTU

#### Assistant Professor

Mau-Sun Chang Ph.D., NTU

Yung-Shu Kuan Ph.D., University of North  
Carolina at Chapel Hill, NC,  
U.S.A.

#### Lecturer

Chia-Hsing Ho M.S., NTU

#### Part-Time

#### Professor

Tung-Bin Lo Ph.D., Tohoku University,  
Japan

Mu-Chin Tzeng Ph.D., The Rockefeller  
Univ., U.S.A.

Wen-Chang Chang Ph.D., NTU

#### Associate Professor

Yu-May Lee Ph.D., NTU

Kay-Hooi Khoo Ph.D., University of  
London, U.K.

#### Assistant Professor

Tzu-Ching Meng Ph.D., University of  
Nebraska Medical Center,  
U.S.A.

Rita P.Y.Chen Ph.D., University of Cam-  
bridge, U.K.

Guang-Chao Chen Ph.D., University of Texas at  
Austin, U.S.A.

Yu-Ling Shih Ph.D., University of Cam-  
bridge, U.K.

Wei-Yuan Yang Ph.D., University of Illinois  
at Urbana-Champaign,  
U.S.A.

#### Lecturer

Ming-Jhy Hseu Ph.D., NTU

Shun-Chang Wang Ph.D., NTU

## FACILITIES

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The institute occupies a space of about 2970 sq. meters, including the front building of 1980 sq. meters and a new back-wing 5-story annex building of 990 sq. meters. The Institute provides 16 units of research laboratories with 100-115 sq. meters per unit for each of the faculty members. In addition, there are several class rooms and rooms of common facilities, including group-meeting and discussion rooms, and a library for students and faculty. The university also provides one floor in the administrative building of the College of Natural Sciences for undergraduate lab courses. Some members with joint appointments at the Institute of Biological Chemistry of Academia Sinica are also provided some lab space for research at the Nankang campus. The major research equipment in the Institute include: Ultracentrifuge, HPLC, UV and Fluorescence spectrophotometers, Dynamic light-scattering spectrophotometer, Circular dichroism spectropolarimeter, polygraph, EIA reader, Automatic pH titrator, Gamma-counter, Nucleic acid sequencer, Amino acid sequencer, Carbohydrate analysis system, DNA synthesizer, Peptide synthesizer, Laser Confocal Microscope, X-ray Diffractor and Mass spectrometer, etc. The library has about 2,000 books in biochemistry and related areas and more than 50 biochemical periodicals. Some teaching aids for lectures and seminar courses are also available, which include state-of-the-art computers and projectors plus VCD/DVD movie viewing room.

## COURSES

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The Institute offers Ph.D. and M.S. programs. The candidates for the Ph.D. degree must fulfill a minimum of 18 credits in course work, pass the qualification examinations, and complete a doctoral dissertation (12 credits in addition) with publications in high-level refereed journals. The candidates for the M.S. Degree must fulfill a minimum of 24 credits in course work and complete a M.S. thesis of 6 credits. The required courses and credits for Ph.D. students are: Research training (4), Seminar (2), Group discussion (2), Discussion in advanced biochemistry (3). The required courses for M.S. students are: Research training (4), Seminar (2), Group discussion (2), Cellular and Molecular Biology (4), Chemical and Structural Biology (2,2), Methods and Experiments in Biochemistry (2). Besides, the Institute is also in charge of undergraduate "Biochemistry" courses for students on the university campus and the "Experiment in biochemistry" course for the students of the Colleges of Life Science and Natural Sciences, the Department of Animal Science and Technology, the Department of Veterinary Medicine, and the Department of Plant Pathology and Microbiology. In August 2003, the Institute moved from the College of Natural Sciences to the new College of Life Science. To face the new challenge of integrating interdisciplinary sciences, the Institute was authorized to establish a new undergraduate department of Biochemical Sciences and Technology by teaming up with the

Department of Agricultural Chemistry starting from the fall semester of 2003.

## ACADEMIC ACTIVITIES

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### Research fields

Protein Chemistry and Proteomics, Physical Biochemistry and Molecular Biophysics, Structural Biology, Genetic Engineering and Functional Genomics, Glycoscience, Molecular Reproduction, Drug Discovery, Signal Transduction, Development Biology.

### Research focus and projects

1. Molecular Biology of cell surface glyco-structure expression.
2. Molecular mechanism and signaling pathway involved in cell membrane repair.
3. Molecular mechanism and signaling pathway in cell responses to stress.
4. Post-translational modifications in their functions in cells.
5. Investigate neuronal generation and wiring using zebrafish habenulo-interpeduncular circuit as a vertebrate model
6. Studies of Expression Mechanisms and Functions of Human T Cell Receptors.
7. DNA damage responses in Cancer Biology.
8. Mouse male reproduction.

Many of our research reports are published in prestigious international periodicals, or presented at international meetings. The Institute has regularly invited speakers of related biochemical sciences for lectureships and symposia. The faculty and students also actively participate in the activities of Taiwan Biochemical and Molecular Biology Society, which include international meetings and domestic annual conferences of biochemistry and molecular biology.

## CONTACT INFORMATION

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# 9. INSTITUTE OF MICROBIOLOGY AND BIOCHEMISTRY

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## INTRODUCTION

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The Department of Microbiology at NTU Medical School has, since its origin in 1947, been exceptionally active and well-organized in education and in research. By means of the NTU hospital next to medical school, the department of Microbiology can invite lots of researchers associated with clinical medicine to investigate the academic fields and share the scientific resources. There are many academic institutes, such as the CDC, Academia Sinica, Genomic research center and department of health, adjacent to the department of Microbiology. This multidisciplinary environment provides students having enterprising spirit opportunities to obtain abundant knowledge about Microbiology and its related field. Even though your backgrounds are different or insufficient in this field, we provide the platform of the various Microbiology courses, such as introduction of microbiology, advanced microbiology, molecular biology, etc. In addition, many of the labs in our department offer opportunities to understand a particular aspect of bacteria, virus, cancer, immunology, gene therapy by utilizing logic thought and advanced scientific techniques, and these skills will be tremendously valuable as a student pursues a goal of becoming a research scientist.

## FACULTY

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The institute comprises of 31 academic staffs, all holding Ph.D. degree. Professor Emeritus: 7

Ph.D. Degree: 22

Emeritus Professor: 1

Joint Professors: 3

Professors: 6

Associate Professors: 5

Part-Time teachers: 6

Project-Appointed Assistant Professor: 1

Teaching Assistants: 3

### Section head/ Professor

Show-Li Chen      Ph.D., Immunology & Infectious Disease, The Johns Hopkins University

### Emeritus Professor

Czau-Siung Yang      M.D., D.M. Sc., Medical Science, Taihoku Imperial University Faculty of Medicine, Matsumoto Medical School

### Joint Professor

Pei-Jer Chen      M.D., Ph.D., Pathology, NTU, Pennsylvania University

Yuan-Tsong Chen M.D., Ph.D., Human Genetics, NTU, Columbia University

Jean-San Chia D.D.S., Ph.D., Microbiology, NTU

### Full-Time

#### Professor

Jin-Town Wang M.D., Ph.D., Clinical Medicine, NTU

Ching-Hwa Tsai Ph.D., Medical Microbiology & Immunology, Ohio State University

Won-Bo Wang Ph.D., Biological Sciences, Purdue University

Shu-Chun Teng Ph.D., Biochemistry, Rutgers University

Mei-Ru Chen Ph. D., Microbiology, NTU

#### Associate Professor

Tsuey-Ying Hsu Ph.D., Veterinary Microbiology, Immunology and Parasitology, Texas A&M University

Shin Chang Ph.D., Biochemistry, University of Southern California School of Medicine

Shin-Lian Doong Ph.D., Human Oncology, University of Wisconsin-Madison

Shiou-Hwei Yeh Ph. D., Molecular Medicine, NTU

Tsai-Kun Li Ph.D., Pharmacology, Rutgers University & University of Medicine and Dentistry of New Jersey

### Part-Time

#### Professor

Lih-Hwa Hwang Ph.D., Molecular Biology, Princeton University

Jen-Yang Chen Ph.D., Medical Microbiology, London School of Hygiene and Tropical Medicine

Michael M.C. Lai M.D., Ph.D., Mol. Biol., NTU, Univ. California-Berkeley

Wei-Kung Wang M.D., D.Sc, Cancer Biology, NTU, Harvard University

#### Associate Professor

Chien-Ts Chu Ph.D., Virology and Epidemiology, Bagler College of Medicine

#### Assistant Professor

Hung-Yi Wang Ph. D., Life Science, NTNU

Project-Appointed Assistant Professor

Tzu-Lung Lin Ph. D., Microbiology, NTU

## FACILITIES

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The institute is located mainly in the new and old (Building 3) Agricultural Chemistry buildings. A number of microbiology laboratories are located on the first floor and basement of the Agronomy Building. In addition to the institute office, meeting room, shared core facility laboratories, five shared classrooms and four student laboratories, each staff member has an independent laboratory. The institute is equipped with modern research facilities, such as peptide synthesizer, monoclonal antibody production laboratory, real time-PCR, thermal cyclers for PCR, capillary electrophoretic system, ultracentrifuges, HPLC, 96-well reader for luminescence, fluorescence, UV and visible spectrometer, UV-vis spectrophotometers, fluorimeters, fraction collectors, jar fermentors with microprocessor, image analyzers, beta-counters, microscope with fluorosepectro-system, various electrophoretic systems, freeze dryers, electroporator, mammalian cell culture lab., plant cell culture lab., lab animal room and related facility, transmission and scanning electron microscope, X-ray diffraction, flow Cytometry etc.

## COURSES

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### 1. Master Program: Minimal requirement: 24 credits of courses plus 6 credits of master thesis

(1) Absolute required courses: Seminars (4), Research methods in microbiology and biochemistry I,II (1,1), Master thesis (6), Biochemistry division: Biochemistry Exploration I-IV(4).

(2) Selective required courses: Students of each division are required to select minimally 10 credits from courses listed under that division.

**Bioindustry division:** Microbial physiology(2), Industrialmicrobiology(2), Enzyme purification and analysis(1), Enzyme purification and analysis Lab(3), Protein structure andfunction(2), Biotechnological diagnosis of microorganism(2), Breeding of industrialmicroorganism(2), Genetically modified food(2), Functionalfood(2), Plant cell culture and industrial application(2), Molecular virology(2), Virology(2).

**Biochemistry division:** Plant carbohydrate metabolism and gene regulation (1), Plant secondary metabolism in plant (2), Enzyme purification and analysis (1), Enzyme chemistry Lab (3), Plant molecular biology (3), Molecular biology (4), Molecular genetics (4), Culture of plant cells and tissues (2), Culture of plant cells and tissues Lab.(2), Biomolecular kinetics (2)  
Nutritional science division: Enzyme chem-

istry (2), Enzyme purification and analysis (1), Enzyme purification and analysis Lab (3), Nutrition epidemiology (2), Nutrition and immunology (2), Mineral nutrition (2), Vitamin nutrition (2), Endocrinology & metabolism (2), Epidemiological study: design and data analysis (2), Nutrigenomics (2)

**Microbiology division:** Industrial microbiology(2), Enzyme purification and analysis(1), Enzyme purification and analysis Lab(3), Protein structure and function(2), Practical protein crystallization(1), Research methods in molecular microbiology(1), introduction to structural biology(2), Virology(2), Proteomics(1), genomics(2), Genomics lab(2), Tools for proteomics(1).

## **2. Ph.D. Program: Minimal requirement: 18 credits of courses plus 12 credits of Ph.D. thesis.**

Bioindustry Division: Seminars (4), Ph.D. thesis (12)

Biochemistry division: Seminars (4), Ph.D. thesis (12), Advanced Topics in Biochemistry(4-14)

Nutritional Science Division: Seminars (4), Ph.D. thesis (12)

Microbiology division: Seminars (4), Ph.D. thesis (12)

## **ACADEMIC ACTIVITIES**

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International and local scientists of related fields are invited to give academic seminars. Symposia on focal issues are held for the enhancement of research and development. Staff, faculty and students regularly attend annual meetings and symposia of international and local academic societies of related fields, including biochemistry and molecular biology, biotechnology, microbiology, nutrition and food science.

## **CONTACT INFORMATION**

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# 10. INSTITUTE OF FISHERY BIOLOGY

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## INTRODUCTION

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Fishery is a traditional and economically important industry in Taiwan. The main objective of fisheries biology is to clarify the structure, dynamics of fisheries resources and the interaction with related environmental variation. For the purposes of improving research on fisheries resources, the Institute of Fishery Biology was established in 1954 based on the cooperation of the Ministry of Economics Affairs and this university. The building of the Institute sat at the back of Department of Zoology until 1983. With the expansion of research projects, a new building, Fisheries Science Building, was built and supported by the Council of Agriculture in 1983. This institute is focused on biology and ecology of fisheries resources, including far-sea, neritic, coastal fisheries, aquaculture, and freshwater resources.

## FACULTY

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Full-time fellows:

Part-time fellows:

Part-time research fellow: 4

Technicians: 3

### Director

Chu-Fang Lo                      Ph.D., University of Tokyo,  
Japan.

## FACILITIES

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The Institute of Fishery Biology conducts research on the biology and ecology of economic fisheries resources in far-sea, neritic, coastal fishery, aquaculture, and freshwater ecosystem. This institute has no educational responsibilities, but we provide long-term monitoring on fisheries resources in Taiwan, and support research facilities to professors, research fellows and senior students of other departments and institutes.

## PROGRAMS

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Our researches mainly consist in long-term monitoring of fisheries resources and ecosystems. The recent projects are:

- (1) Far-sea squid fisheries resources: including population structure, stock assessment, fisheries oceanography, and fisheries management.
- (2) Freshwater ecosystem: including systematics of freshwater fishes, freshwater ecology, coastal watch on fishery impacts, and water pollution.
- (3) Aquaculture: including pathological studies on aquatic organisms, control of fish disease, improvement of aquatic environment, stock enhancement.

## ACADEMIC ACTIVITIES

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Occasional conferences are held.

## CONTACT INFORMATION

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# 11. COMMITTEE OF FISHERY EXTENSION

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## INTRODUCTION

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The Committee of Fishery Extension (CFE), NTU (NTUCFE) was established in 1986 with the approval of the Ministry of Education, Executive Yuan. In the meantime, CFEs at National Taiwan Ocean University, National Sun Yat-sen University and National Kaohsiung Marine University were established, respectively. The purpose of the establishment of CFE is to coordinate fishery and aquaculture, education, research and extension of fishery and aquaculture technology, to assist fishery organization in obtaining new techniques and management in fishery work.

Four Extension Professors, one Secretary and one Administrative staff are involved in the Committee. All staff members are elected from among the professors in the College of Life Science in the field of fishery and aquaculture, except for the administrative staff. The extension professors make efforts in supporting research assignments beneficial for fishery extension.

## **The Committee's responsibilities include:**

1. Assist fishery organization to improve the coordination of fishery extension.
2. Assist in processing courses related to the special fishery talents.
3. Provide technical services on fishery science.
4. Coordinate fishery administration and fishery extension organization to conduct the production techniques and education affairs of fishermen.
5. Consult on the technical problems in providing technical services and management information.
6. Participate in and consult for conferences on fishery and related associations.
7. Assist in electing outstanding fishermen and fishery extension staff.
8. Supply guidance for improving techniques in the related members for fishermen's association.
9. Coordinate fishery administration and hold workshops on fishing and aquaculture techniques.
10. Publish fishery extension newsletter.



The extension professors can be invited by related organizations and give circuit lectures or short-term training courses around Taiwan. The professors should visit fishery areas and give advice on resolving the problems related to fishermen.

To date the CFE has created various new concepts for the improvement of aquaculture technology. For the success of fishery industries, we will continue do our best to reach these stated goals.



## CONTACT INFORMATION

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