National Cheng Kung University

MASTER of "The International Institute of Medical Device Innovation, MDI"

Department of Biomedical Engineering
National Cheng Kung University

MDI devotes to cultivate talents to identify the unmet clinical needs and accordingly prepare for value-oriented medical device industry and medicine of future.

GET ON THE RIGHT TRACK TO MEDICAL DEVICE INNOVATION

SOLVE THE MADICAL PRACTICE CHALLENGES. ENGINEER SOLUTIONS TO UNMET CLINICAL NEEDS. EXCEL IN ENTREPRENEURSHIP, TECHNOLOGY COMMERCIALIZATION, CLINICAL TRIALS, AND REGULATORY ISSUES.

Earn your degree at the National Cheng Kung University under the resourceful environment surrounded by Engineering School, Medical School & Management School.
The International Institute of Medical Device Innovation (MDI) is a new master program that integrates bio-engineering design and entrepreneurship education to creatively address unmet clinical needs.

THE PROGRAM FEATURES

1. Entrepreneurial focus – Learn about business issues specific to medical device technology commercialization.
2. Technology concentration areas focus – Choose a technical emphasis area from biomechanics, bioelectronics, biomaterials, biomedical imaging and informatics.
3. Design skills training – Participate in a BioDesign team to complete a design project which solve real clinical problems or full-time industry internship.
4. Clinical focus– Work with faculty and physician of NCKU hospital to identify unmet clinical needs.
5. Regulatory focus – Work with regulatory experts and startup companies to understand the regulatory issues while bringing new technology to market.

Department of BioMedical Engineering (BME)

The Institute of Biomedical Engineering (BME) at National Cheng Kung University (NCKU) was founded in 1988. The BME aims to develop multidisciplinary programs that integrate biomechanics, medical electronics, biomedical materials, bioinformatics, and rehabilitation technology. In 2011, a major milestone was achieved with the establishment of the undergraduate program. The expansion enables the BME to offer a more comprehensive curriculum at the undergraduate and graduate levels for students.

Biomedical engineering is a multidisciplinary science that covers subjects from mechanical engineering, electrical engineering, material engineering, and chemical engineering to those related to nano- and micro-electromechanical technology. Applications include life sciences, basic medicine, clinical medicine, regenerative medicine, stem cell research, and tissue engineering.
NCKU is a world-renowned university with extensive research resources supported by the College of Engineering, the College of Electrical Engineering and Computer Science, the College of Medicine, and the Medical Center. The integrated environment provides a center for cultivating specialists of biomedical engineering in southern Taiwan. The establishment of the Medical Device Innovation Center, one of the four research centers on campus funded by the Taiwan Ministry of Education, was approved in 2011. Medical devices have become one of the featured developments at NCKU.

In summary, the BME aims to become an incubation center for developing human-oriented technology in the new century.

CURRICULUM

The Master Program must be completed within 2 to 4 years for international students and 2 to 5 years for local students. The scholarship for international students expires 24 months after enrollment.

Core Curriculum

BioDesign (1) – identify unmet needs & practice invention skills
BioDesign (2) – implementation of innovative medical devices
High-Tech Entrepreneurship and Venture Capital
Bio-Tech Industrial Analysis
Medical Device Regulatory
Intellectual Property Rights and Management
Statistics and Clinical trials for Medical Device

TECHNICAL CONCENTRATION COURSES

1. Biomechanics
2. Bioelectronics
3. Biomaterials
4. Biomedical Imaging and informatics

In addition to the Core Curriculum of design skills and entrepreneurship courses, students will demonstrate competency in their selected Technical Concentration Area by taking some required and elective courses, for a total of at least 9 credits.

Course Requirements

Minimum of 30 credits need to be fulfilled.
Students are required to take the following:

- ✓ **Core Curriculum: 6 credits**
- ✓ **Technical Concentration Area: 20 credits**
- ✓ **Credits for the seminar: 4 credits**

Scholarships and Free Chinese Courses

Our international program offers a variety of scholarship grants to interested and qualified applicants from all over the world.

NCKU SCHOLARSHIP

The NCKU Scholarship is offered to most of NCKU international graduate student who are qualified. The scholarship benefits include tuition waiver and monthly stipend. Further information, please refer to the NCKU website:
https://admissions.oia.ncku.edu.tw/doc/view/sn/8

TAIWAN SCHOLARSHIP

The Taiwan Scholarship is a monthly stipend given to promising foreign students who qualify and want to pursue their master's degrees at universities/colleges in Taiwan by the Taiwanese Government. Scholarship recipients will be given a monthly stipend of NT$25,000 for the LEP and NT$30,000 for degree programs. Further information, please refer to the TAFS website:
http://tafs.mofa.gov.tw/Default.aspx?loc=en

FREE CHINESE CLASSES

Being an international program, students are entitled to attend free Chinese classes per semester at NCKU Chinese Learning Center. Learn the beautifully intricate Chinese language and assimilate better into new surroundings.

FACULTY

Jia-Jin Chen
Distinguished Professor, Chair

Ph.D., Biomedical Engineering, Vanderbilt University
Neural Engineering; Neural Interface; Electrical Stimulation, Neuromodulation, Brain stimulation

Fong-Chin Su
Distinguished Professor

Ph.D., Mechanical Engineering, University of Rochester
Biomechanics of Human Movement; Gait Analysis; Musculoskeletal Dynamics; Muscle Mechanics, Rehabilitation Engineering; Motor Control

Hsien-Chang Chang
Distinguished Professor

Ph.D., Applied Chemistry, Tohoku University
Electrochemistry; Biosensor; Analytical Chemistry; Biomaterials ad Tissue Engineering; Nano-metrology

Chih-Han Chang
Professor

Ph.D., Mechanical Engineering, Rice University
Medical Engineering; Orthopaedic Biomechanics, Dental Biomechanics; Finite Element analysis; Computer Aided Engineering

Tain-Song Chen
Professor

Ph.D. Electrical Engineering, Michigan State University
Medical Ultrasound; Osteoporosis assessment; Wireless physiological signal monitoring; Eye movement research

Kuo-Sheng Cheng
Professor

Ph.D., Electrical Engineering, National Cheng Kung University
Bioimpedance technology and imaging; Biomedical instrumentation and measurement; Medical image processing and analysis

Chou-Chin Lin
Professor

Ph.D., Biomedical Engineering, Case Western Reserve University; MD, National Yang Ming University
Neuro-physiology; Neuro-biomechanics; Neuro-regeneration

Ming-Long Yeh
Associate Professor

Ph.D., Biomedical Engineering, Texas A&M University
Biocompatibility ; Orthopedic Biomechanics; Cartilage Tissue Engineering; Atomic Force Microscopy; Cell mechanics; Mechanobiology

Rung-Fu Kuo
Associate Professor

Ph.D., Biomedical Engineering, Iowa University
Patent and Regulation in Medical Device; Technique Innovation; Dental and Orthopedic Device

Jin-Jia Hu
Associate Professor

Ph.D., Biomedical Engineering, Texas A&M University
Soft tissue mechanics; Cardiovascular Mechanics; Tissue Engineering; Bioreactor; Mechanobiology

Han-Sheng Chuang
Associate Professor

Ph.D., Mechanical Engineering, Purdue University
Biomicrofluidics; NEMS/MEMS; Optical Diagnostics; Biomechanics of C. elegans

Chih-Chung Huang
Associate Professor

Ph.D., Biomedical Engineering, Chung Yuan Christian University
Biomedical Electronic Equipment Design; Medical Ultrasound Imaging; Medical Image Processing

Peng-Ting Chen
Associate Professor

Ph.D., Technology Management, National Chiao Tung University
VC and Entrepreneurship; Technology Commercialization; Biotechnology and drug engineering; systems and Synthetic biology

Wen-Tai Chiu
Associate Professor

Ph.D., Basic Medical Sciences, National Cheng Kung University
Calcium Signaling; Molecular Imaging; Cell Apoptosis; Cancer Metastasis

Yu-Hua Fang
Assistant Professor

Ph.D., Biomedical Engineering, Case Western Reserve University
Image processing for molecular images; Biomedical engineering methods for improving diagnosis accuracy; Biomedical informatics

Ping-Ching Wu
Assistant Professor

Ph.D., The Institute of basic Medicine Science of National Cheng Kung University
Translational nanomedicine; Medical Devices Development; Molecular Biology of the Cell; Oncology

Che-Wei Lin
Assistant Professor

Ph.D., Electrical Engineering, National Cheng Kung University
Biomedical signal processing, Inertial signal processing, Wearable device design, Embedded system design, Neural Network IC design

Tai-Hua Yang
Assistant Professor

Ph.D., Department of Biomedical Engineering, National Cheng Kung University; M.D., China Medical University
Orthopedic Biomedical Research; Applied Medical Image processing; Medical Device & Rehabilitation Equipment Research and Development; Orthopedic Molecular Biology

Ting-Yuan TU
Assistant Professor

Ph.D. Mechanobiology, National University of Singapore
Microfluidics; Tumor Microenvironment; 3D Cell Culture; Circulating Tumor Cells; Rapid Prototyping

ADJUNCT PROFESSOR

Tzer-Min Lee
Professor

Ph.D., Materials Science and Engineering, National Cheng Kung University
Biomaterials; Biomedical Engineering; Medical Implants

Chia-Ching Wu
Associate Professor

Ph.D., Biomedical Engineering, National Cheng Kung University
Tissue Engineering and Regenerative Medicine; Cell Mechanics; Vascular Plasticity

Hsieh Ching-ho
Professor

Ph.D., Department of Bioengineering, University of Washington, Seattle, WA, USA
Stem cells and regenerative medicine; Nanobiotechnology; Translational research

Jeng-Jiann Chiu
Professor

Ph.D. in Fluid Mechanics,, Institute of Aeronautics and Astronautics,, National Cheng-Kung University
vascular biology, cellular and molecular biology, experimental biology, fluid mechanics, and tissue engineering

EMERITUS PROFESSOR

Ting-Yuan TU
Assistant Professor

Ph.D., Mechanical Engineering, Tennessee University
Biomechanics; Experimental Biomechanics; Clinical Engineering; Motion Analysis; Orthopedic Biomechanics; Arthroplasty

Who Should Apply?

1. **Strong candidates will hold a B.S. or higher degree in engineering, biotechnology, medical science or other interdisciplinary fields.**

2. **Business/management or industrial design students with great interest in pursuing medical device entrepreneurship and career are encouraged to apply.**

Life in Taiwan and NCKU Campuses

National Cheng Kung University is located in the historical and cultural capital of Taiwan, Tainan City. It is situated across from the Tainan Railway Station, offering convenient transportation to get anywhere on island. Tainan City has not only good location infrastructure, but it is also close to the High Speed Rail station and Kaohsiung international Airport.
The total area of NCKU is 186.5 hectares, including 10 Campuses, and some areas designated for dormitory use. It is one of the most spacious and beautiful university campuses in this country.

Careers & Future Prospects

MDI trains students to play a pivotal role in connecting engineering design to address clinical challenges and fulfill the market-based demands of medical device industry. Graduates will have in-demand skills for work in biomedical device industry and translational research. Relying on the accumulation of know-how and the aid of advanced medical devices, we can shape a better future of modern healthcare. NCKU is closely link to Southern Taiwan Science Park and Hsinchu Biomedical Science Park for medical device manufacturing companies and startup companies.

The College of Engineering at NCKU has strong ties with industry, abundant resources, a good reputation, and a high ranking among other counterparts in the world. Our graduates are highly competitive in the job market ranking number 1 in several surveys.

To attract international students and connect with the world, we offer courses lectured in English and encourage our faculty to put effort into not only innovative research but also high-value applications in industry. The MDI/BME is one of the first programs focusing on biomedical engineering entrepreneurship in Asia and will become more influential because an increasing number of alumni who carry the spirit of NCKU strive to shine their talents worldwide. We sincerely welcome you to join the Department of Biomedical Engineering at NCKU. Be part of us and be part of success.

Application

Fall Semester	**1/10 ~3/30** Deadline	**5/20** Admission Announcement **6/15** Admission Letters Mailed
Spring Semester	**7/10 ~10/10** Deadline	**11/20** Admission Announcement **12/1** Admission Letters Mailed

Application Methods

Complete the application online at the website before the deadline:
http://admissions.oia.ncku.edu.tw

1. Register for only ONE account (please use your Email address as your username) on the admission website "NCKU International Students Admission System": http://admissions.oia.ncku.edu.tw
2. Log in and complete the online application to receive the application serial number
3. Pay the application fee (NT $1,600 or US $60 will be charged for each applicant).
4. Upload all supporting documents/files (PDF files only).
5. To facilitate recommendation letters, we provide an online recommendation system. Please follow the online instructions step by step for completing the application.

Tuition and other fees please refer to the website:
https://admissions.oia.ncku.edu.tw/doc/view/sn/9

For Further Details

For further details please contact:

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