



**Department of Biomedical Engineering
National Cheng Kung University
Tainan, Taiwan**



About Us

The Institute of Biomedical Engineering (BME) at National Cheng Kung University (NCKU) was founded in 1988. The BME aims to develop multi-disciplinary 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.

Research Fields

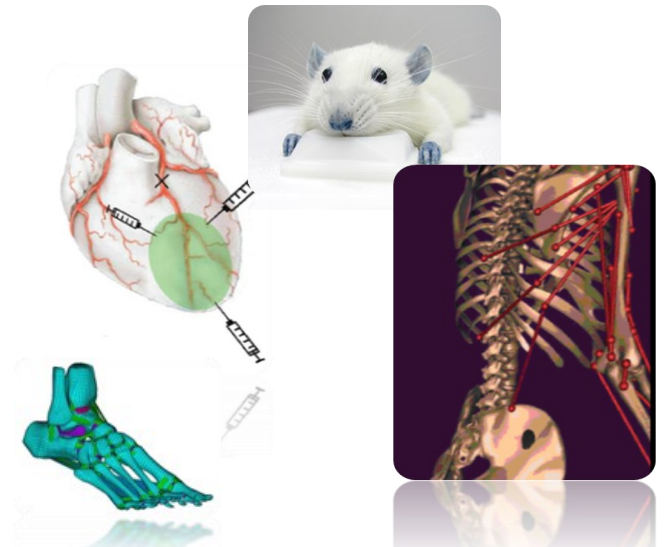
BME Faculty Directory			
Name	Position	Education Background	Expertise
Fong-Chin Su	Distinguished Prof.	Ph.D., Mech. Eng., Uni. Rochester	Biomech. of Human Movement; Gait Analysis; Musculoskel. Dynamics; Rehab. Eng.; Motor Control
Hsien-Chang Chang	Distinguished Prof.	Ph.D., Applied Chem., Tohoku Uni.	Electrochemistry; Biosensor; Analytical Chem.; Biomaterials & Tissue Eng.; Nanometrology
Jia-Jin Chen	Distinguished Prof., Chair	Ph.D., BioMed. Eng., Vanderbilt Uni.	Neural Eng.; Biomedical Eng.; Neural Interface; Integration of Cortical
Chih-Han Chang	Professor	Ph.D., Mech. Eng., Rice Uni.	Medical Eng.; Orthopaedic Biomechanics, Dental Biomech.; FEM; Comp. Aided Eng.
Kuo-Sheng Cheng	Professor	Ph.D., Elec. Eng., National Cheng Kung Uni.	Bioimpedance Technol. & Imaging; Biomed. Inst. & Meas.; Med. Image Processing & Analysis
Tain-Song Chen	Professor	Ph.D. Elec. Eng., Uni. Michigan	Med. Ultrasound; Osteoporosis; Wireless Physiological Signal Monitoring; Eye Movements Research
Jin-Jia Hu	Assoc. Prof.	Ph.D., BioMed. Eng., Texas A&M Uni.	Soft Tissue Mech.; Cardiovas. Mech.; Tissue Eng.; Bioreactor; Mechanobiol.
Ming-Long Yeh	Assoc. Prof.	Ph.D., BioMed. Eng., Texas A&M Uni.	Orthopedic Biomech.; Cartilage Tissue Eng.; AFM; Cell Mechanics; Mechanobiol.
Han-Sheng Chuang	Assoc. Prof.	Ph.D., Mech. Eng., Purdue Uni.	Biomicrofluidics; NEMS/MEMS; Optical Diagnostics; Biomechanics of Microorganisms
Chih-Chung Huang	Assoc. Prof.	Ph.D., BioMed. Eng., Chung Yuan Christian Uni.	Biomed. Electronic Equipment Design; Medical Ultrasound Imaging; Medical Image Processing
Wen-Tai Chiu	Assoc. Prof.	Ph.D., Basic Med. Sci., National Cheng Kung Uni.	Calcium Signaling; Molecular Imaging; Cell Apoptosis; Cancer Metastasis
Yu-Hua Fang	Asst. Prof.	Ph.D., BioMed. Eng., Case Western Reserve Uni.	Image Processing; Biomed. Eng. Methods; Biomed. Informatics
Ting-Yuan Tu	Asst. Prof.	Ph.D., Mechanobiol., National Uni. of Singapore	Microfluidics; Tumor Microenvironment; 3D Cell Culture; Circulating Tumor Cells; Rapid Prototyping
Faculty in Medical Device Innovation Center			
Chou-Chin Lin	Professor	Ph.D., BioMed. Eng., Case Western Reserve Uni.	Neuro-physiology; Neuro-biomechanics; Neuro-regeneration
Rung-Fu Kuo	Assoc. Prof.	Ph.D., BioMed. Eng., Iowa Uni.	Patent & Regulation in Med. Dev.; Technique Innovation; Dental & Orthopedic Dev.
Bing-Chin Wu	Asst. Prof.	Ph.D., Basic Med. Sci., National Cheng Kung Uni.	Nanobiol.; Cellular & Molecular Biol.
Peng-Ting Chen	Assoc. Prof.	Ph.D., Technol. Mgmt., National Chiao Tung Uni.	VC & Entrepreneur.; Technol. Commercialization; Biotechnol. & Drug Eng.; Syst. & Synthetic Boil.
Che-Wei Lin	Asst. Prof.	Ph.D., Electrical Eng., National Cheng Kung Uni.	Biomed. Signal Processing, Inertial Signal Processing, Embedded Syst. Design, Neural Network IC
Tai-Hua Yang	Asst. Prof.	Ph.D., M.D., BioMed. Eng., Natl Cheng Kung Uni.	Orthopedic Biomed. Res.; Applied Med. Image Processing; Med. Dev. & Rehab. Research; Orthopedic Mol. Biol.
Joint Faculty			
Tzer-Min Lee	Professor	Ph.D., Mat. Sci. & Eng., Natl. Cheng Kung Uni.	Biomaterials; Biomedical Engineering; Medical Implants
Cheng-Chien Chiu	Professor	Ph.D., A.A.E., National Cheng Kung Uni.	Vascular Biol.; Cell & Molecule Biol.; Experimental Biol.; Fluid Mech.; Tissue Eng.
Chia-Ching Wu	Assoc. Prof.	Ph.D., BioMed. Eng., National Cheng Kung Uni.	Tissue Eng. & Regenerative Medicine; Cell Mech.; Vascular Plasticity
Adjunct Faculty			
Ming-Shih Tsai	Asst. Prof.	Ph.D., BioMed. Eng., National Cheng Kung Uni.	Neuro-Surgery; Brain Trauma; Intracranial Bleeding; Brain Tumor
Chih-Kun Hsiou	Asst. Prof.	Ph.D., Civil Eng., National Cheng Kung Uni.	Biomechanics; Biomechanics of Materials
Y.-P. Jou	Expert	B.S., Laws, Fu Jen Catholic Uni.	Transnational Management; IPs; M&A
Emeritus Faculty			
You-Li Chou	Prof. Emer.	Ph.D., Mech. Eng., Tennessee Uni.	Biomech.; Exp. Biomech.; Clini. Eng.; Motion Analysis; Orthopedic Biomech.; Arthroplasty



Course Information



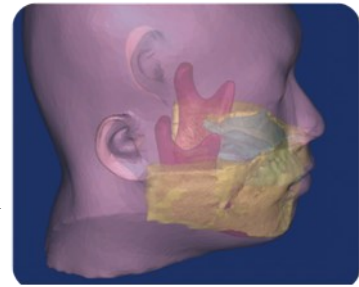
The scope of biomedical engineering research is broad. In the BME, the core curriculum is categorized into three areas, namely (1) bioelectronics and medical imaging, (2) biomechanics and medical devices, and (3) biomaterials and tissue engineering. In the undergraduate program, laboratory practices are highly emphasized. Therefore, undergraduate students have the same opportunities as those of their graduate counterparts to use advanced equipment. The laboratory experience strengthens the technical as well as design abilities of our students. Moreover, the BME constantly seeks collaborations with medical centers in southern Taiwan and NCKU Hospital to offer students more clinical practice and knowledge. Senior students are offered specialized training according to their area of study. For those who favor an academic career, advanced engineering knowledge is offered. First-hand information regarding industry and entrepreneurship is offered to those who favor an industrial career.



Features of Curriculum

Interdisciplinary Learning Environment

The BME benefits from its location (midway between the College of Engineering and the College of Medicine) and multidisciplinary faculty. In addition to the courses relevant to biomechanics, bioelectronics, biomaterial, and bioinformatics offered by the department, students are also free to select professional courses from the Colleges of Sciences, Engineering, Electrical Engineering and Computer Science, and Life Sciences and Medicine. Our teaching and curriculum emphasize both theory and practical applications. In research, the BME holds strong ties with all departments of the College of Engineering and the College of Medicine.



Academic Resources



Relying on the advanced equipment, excellent faculty, and abundant resources of the Colleges of Engineering and Medicine, the BME cultivates engineering specialists to develop new biomedical technology by providing them adequate biomedical training and research experience. We also train and educate clinicians with modern engineering technology to enhance their clinical skills. The BME has a long history in biomedical engineering and students with diverse backgrounds, ranging from clinical doctors and nurses to electronics, electrical engineering, mechanical engineering, chemical engineering, life sciences, medical technology, occupational therapy, physical therapy, physiology, anatomy, and sports science. This wide diversity creates a platform for learning and interchange between all areas.

International Activities

The BME maintains constant collaborations and bilateral projects with institutions from the United States, Japan, France, Russia, New Zealand, Israel, and Singapore. We also encourage our students to explore their horizons by attending international conferences. Moreover, the TAIWAN TECH TREK project, sponsored by the Ministry of Science and Technology (MOST), recruits overseas students of Taiwanese descent every summer and winter break to study with Taiwanese students and experience Taiwanese culture at our department. Through these international interactions, we believe that we can broaden our students' horizons and assist them to seamlessly join the global community.



Emphasis on Academia and Industry

The field of biomedical engineering and medical devices is regarded as one of six emerging markets in Taiwan. After the Taiwan Executive Yuan launched the "Biotechnology Takeoff Diamond Action Plan" in 2009 to strengthen the industry's infrastructure, the Ministry of Science and Technology, Ministry of Economic Affairs, and Ministry of Health and Welfare have invested over 1 billion NT dollars every year to promote the "Administration Project for the Promotion of Research and Development of Medical Devices". It is expected that BME-associated industries will flourish in the near future under the strong support from national policies and academic institutions. In our department, most faculty members own key IPs and have very strong ties with industry. We frequently invite renowned figures in academic and industrial fields to lecture courses or give speeches at our seminars. Co-op education has grown since we started our undergraduate program. With a variety of diverse courses, seminars, and co-op education, we believe that all students who graduate from the BME will be highly competent in both academia and industry.



Careers

The BME recruits 35 undergraduate students every year. After graduation, students may consider earning the license issued by the Taiwan Society of Biomedical Engineering to enhance their competitiveness in the job market. For those who have excellent academic performance, the five-year BA-MA program may be an additional option. After having received their master's degrees, students are encouraged to pursue their Ph.D. degrees in domestic or foreign universities. Graduate students who have received their degrees may choose to become researchers in academic institutions, such as Academia Sinica, National Chung-Shan Institute of Science & Technology, Industrial Technology Research Institute, and National Health Research Institutes, or join the faculty in a university, including our department at NCKU. Moreover, we also encourage students who are interested in entrepreneurship to take courses, such as bio-designs, in order to prepare themselves to be future entrepreneurs.



Future Prospects

Development of biomedical engineering plays a pivotal role in the evolution of life sciences, basic medicine, and biotechnology. With the theories, techniques, and equipment developed by biomedical engineering, basic and applied life sciences can better reveal life's inner workings. Relying on the accumulation of know-how and the aid of advanced medical devices, we can shape a better future of modern medicine.

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 engineering graduates are highly competitive in the job market. To attract international students and connect with the world, we keep increasing the number of courses lectured in English every year and encourage our faculty to put effort into not only innovative research but also high-value applications in industry. Every year, the BME becomes 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.

