

清華

NTHU IEEM

NATIONAL TSING HUA UNIVERSITY

Department of Industrial Engineering and Engineering Management



<http://www.ie.nthu.edu.tw>



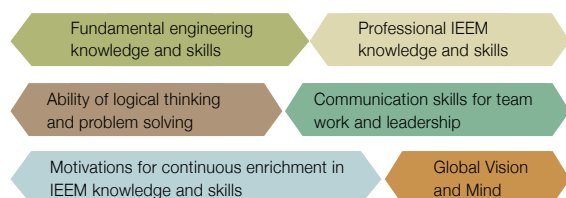
❖ INTRODUCTION

Established in 1974, the Department of Industrial Engineering (IE) at the National Tsing Hua University (NTHU) aims to match the needs for the nation's economic and industrial growth.

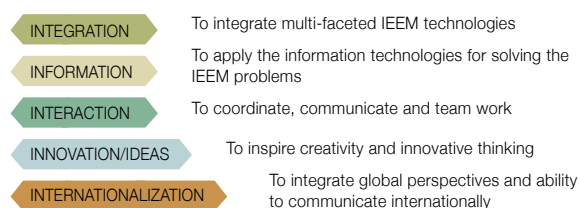
1974	Department of Industrial Engineering Established
1980	M.S. in Industrial Engineering
1985	Ph.D. in Industrial Engineering
1994	Institute of Engineering Management Established
1995	Institute of EM merged with Department of IE
1998	Changed Name into Department of Industrial Engineering and Engineering Management
2003	Engineering Master Program Began

❖ OBJECTIVES

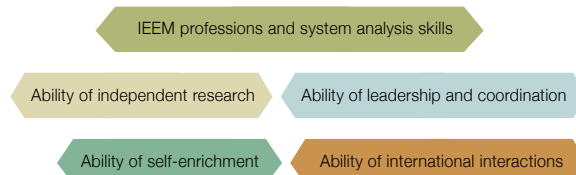
NTHU IEEM is the leading department of industrial engineering and engineering management in Taiwan. Our vision is to become the best one in Asia. We offered innovative curriculum and excellent learning experiences to cultivate the future elites in academia and industry. The aim of our curriculum is to follow the government policies for technology and economic development and meet the industrial targets for productivity and competitiveness. Our educational missions is to equip students with the following capabilities:



According to the educational mission, the five core competences of our undergraduates are:



And we also set up five abilities for our graduate programs to cultivate:



In order to educate students with knowledge of the latest industrial engineering and engineering management, our program is organized in four major areas including Information and Operations Research, e-Business and Operations Management, Ergonomics and Safety Management, and Engineering Management. We also encourage students to get a double major by taking courses in other departments such as Electrical Engineering, Computer Science, and Economics, etc. or to participate in multidisciplinary programs such as Global Supply Chain Management, Quantitative Finance, and E-Commerce etc.

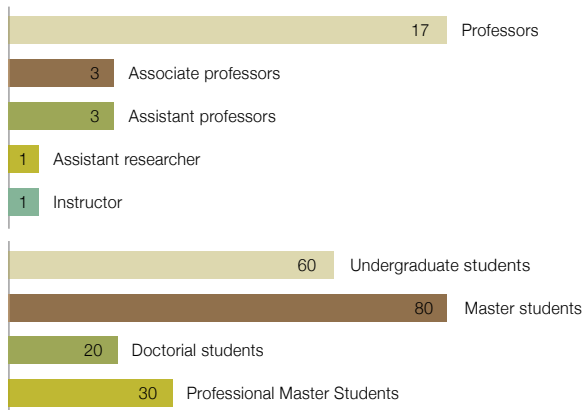
Our educational and administrative policies are set and executed by following our six educational missions; in the meantime, various metrics are used to continuously evaluate student performance in order to ensure our students are well-educated with the core competences upon their graduation. Our students are inspired to contribute to the society for upgrading the competitiveness industrially and globally in all aspects of industrial engineering and engineering management field.

Research Scopes	Academic Programs
Information and Operations Research	Undergraduate Program / Granted for Bachelor Degree
e-Business and Operations Management / Granted for Bachelor Degree	Graduate Program / Granted for Master of Science Degree
Ergonomics and Safety Management	Graduate Program / Granted for Doctor of Philosophy Degree
Engineering Management	IEEM Professional Master's Program / Master of Science Degree
Required Courses	Elective Courses
Engineering Statistics	Electronic Commerce
Production Planning and Control	Global Logistics Management
Quality Control	Marketing Management
Facilities Planning	Programming Design and Applications
Operations Research	Product Design and Development
...	...



❖ FACULTY AND STUDENTS

The IEEM Department has twenty-five full-time faculties, including seventeen professors, three associate professors, three assistant professors, one assistant researcher and one instructor. The students recruit every year for each program are approximately sixty of undergraduate students, eighty for full-time master students, twenty for doctoral students and thirty for part-time master students.



❖ RESEARCH ACHIEVEMENTS

There are four key research scopes of NTHU IEEM. They are 1. Information and Operations Research, 2.e-Business and Operations Management, 3. Ergonomics and Safety Management, 4. Engineering Management. The faculty members are dedicated to teaching, research and professional services based on the four major research scopes. Our faculty members conduct research projects sponsored by the National Science Council and other government units and research institutes. Over 50% of the faculty

have won Excellent Research Awards, and among them, eight have won Outstanding Research Awards from the National Science Council (NSC). Further, many faculty have won the NTHU and College of Engineering Outstanding Teaching Award, three professors have won the Ministry of Education Academic-Industrial Cooperative Research Award, four professors have been awarded the Tsing Hua Chair Professor and three professors have been awarded Tsing Hua Distinguished Professor. There are many NTHU IEEM students supervised by our professors with such outstanding research results that they won various awards from Ministry of Education, National Science Council and Chinese Institute of Engineers.

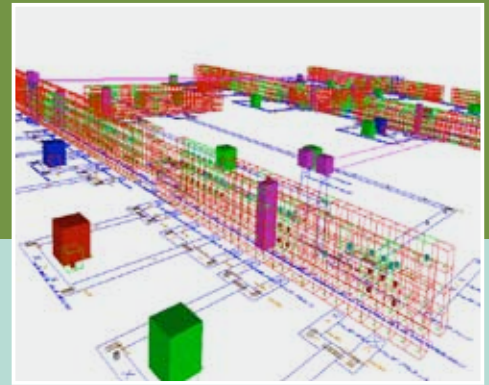
❖ CONTINUING EDUCATION

To the lifelong learning strategy of Ministry of Education, we strengthen the continuing education functions of higher education and provide a flexible continuing education channel for upgrading capabilities and gaining competitive advantages for the industry by IEEM Professional Master's program and Credit Program. The programs realize the concepts of lifelong learning and satisfy the demands for professional management knowledge and career development of the industry.

❖ MIS LABORATORY

Computer has become a more vital and necessary tool for higher education; in particular, computer applications have a great impact on

DEPARTMENT OF INDUSTRIAL ENGINEERING AND ENGINEERING MANAGEMENT



industrial engineering. For example, management information systems, computer-aided design and manufacturing, expert systems, system simulation, mathematical programming, operations research, statistics, production planning, site control, electronic business, and logistics management are typical applications to industrial engineering. The Management Information System (MIS) Laboratory of the Department Industrial Engineering and Engineering Management offers a variety of information services including network servers, personal computers, notebooks, printers, teaching broadcast systems, video conference systems, projectors, etc. The computer equipment in our MIS laboratory sufficiently supports the related courses, research and networking.

❖ PRODUCTION REALIZATION LABORATORY

The Product Realization Lab (PRL) was established by Dr. Chih-Hsing Chu in Fall 2002. The missions of this lab include: We emphasize a balance between intellectual contribution and practicality in our

research activities, which currently are focused on emerging topics such as collaborative product development, design chain integration, e-design, sustainable design, product engineering, and product life management, as well as advanced CAD/CAM. Students are encouraged to excel their potentials in theoretical findings, software development, and experimentation with a strong tie to industry.

❖ KNOWLEDGE MANAGEMENT (KM) & RFID LABORATORY

The goal of the Knowledge Management & RFID Laboratory is to establish an intelligent data and knowledge management platform for industrial applications. By utilizing the Internet and AIDC technologies, we attempt to develop prototype systems to enhance the flexibility, efficiency and security of data acquisition and knowledge analysis, management and accessing. The data/text mining algorithms as well as the OR methodologies, principal component analysis, natural language processing are applied for implementation of the advanced KM technologies and knowledge service models.

❖ ERGONOMICS LABORATORY

The Ergonomics Laboratories are to assist the teaching and research in ergonomics. For teaching, they supply instruments for students to perform hand-on practice to verify the knowledge acquired in lecture; for research, they provide instruments as well as environments for ergonomics research.

The Ergonomics Laboratories consist of 5 laboratories: general, work physiology/biomechanics, cognitive





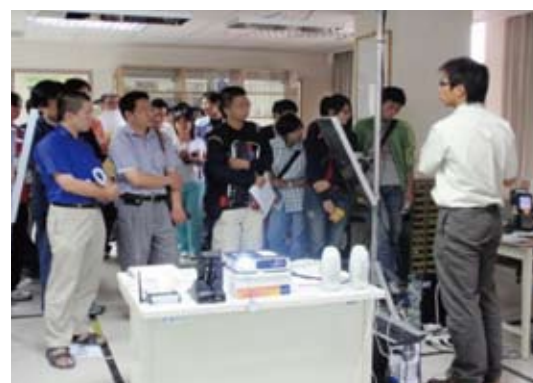
psychology, work environment, and anthropometry.

- ◆ General laboratory is primarily for under graduate basic courses, where contains some large tables for groups' teaching and learning experimental instruments.
- ◆ Work physiology/biomechanics laboratory is mainly for work physiology /biomechanics courses and research. It equipped with oxygen consumption analyzer, pulmonary function testing system, EMG system, force plate, force dynamometer, motion analyzer, and 3D body scanner.
- ◆ Cognitive psychology laboratory is designed for human information processing and human-machine system courses and research. It equipped with handy flicker, speed approximation device, eye tracking system, standard lighting chamber, and many human-machine interface instruments.
- ◆ Work environment laboratory is established for environment testing, vision and color, safety courses as well as research it supply luminance meter, photoradiometer, sound analyzer, WBGT system, microwave survey meter, vibration analyzer, and etc.
- ◆ Anthropometry is devised for digital anthropometrical

surveys and its application research it equipped FADO 3D digitizer, 3D body scanner, 3D hand/foot scanner, and etc.

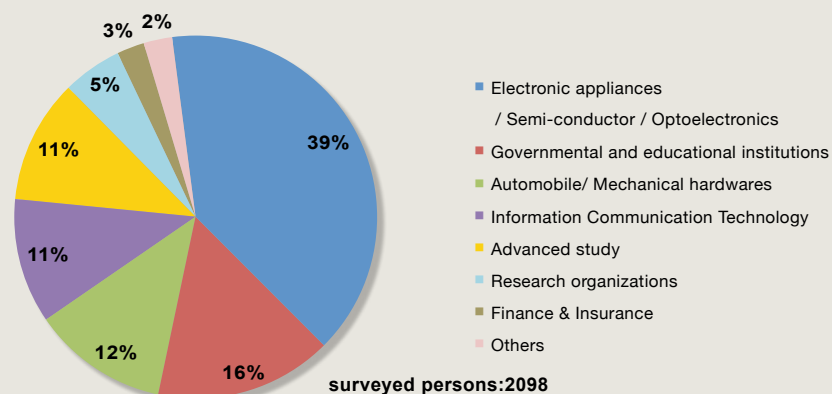
❖ ENTERPRISE LOGISTICS AND E-BUSINESS CENTER (ELEBC)

The Enterprise Logistics and E-Business Center (ELEBC) is an innovative resource center for research and education sponsored by the Ministry of Education, National Science Council, Ministry of Economic Affairs, and other public and private organizations. A three-tier architecture is planned and developed for ELEBC operations by integrating and incorporating resources from industries, government agencies, educational institutions, and academic research centers. Through the architecture, the most-updated software and hardware resources can be customized and demonstrated to industrial users without the limitations of locations and time. Consolidating the technical infrastructure and outreach strategies, the major accomplishments of the center are categorized as outreach, education, prototype hosting, and advanced technology (R&D) transfer.





1978-2012 Career Distribution of IEEM Alumni



❖ QRC (QUALITY RESEARCH CENTER)

The QRC (Quality Research Center) was established in January 2005. The mission of QRC is to upgrade enterprise's quality level by establishing an interactive platform through incorporating resources from industries, governmental agencies, educational institutions, and academic research centers. The QRC also aims to become a leading quality research center in Taiwan, and endeavors to provide enterprises with substantial services on quality improvement to gain a competitive advantage.

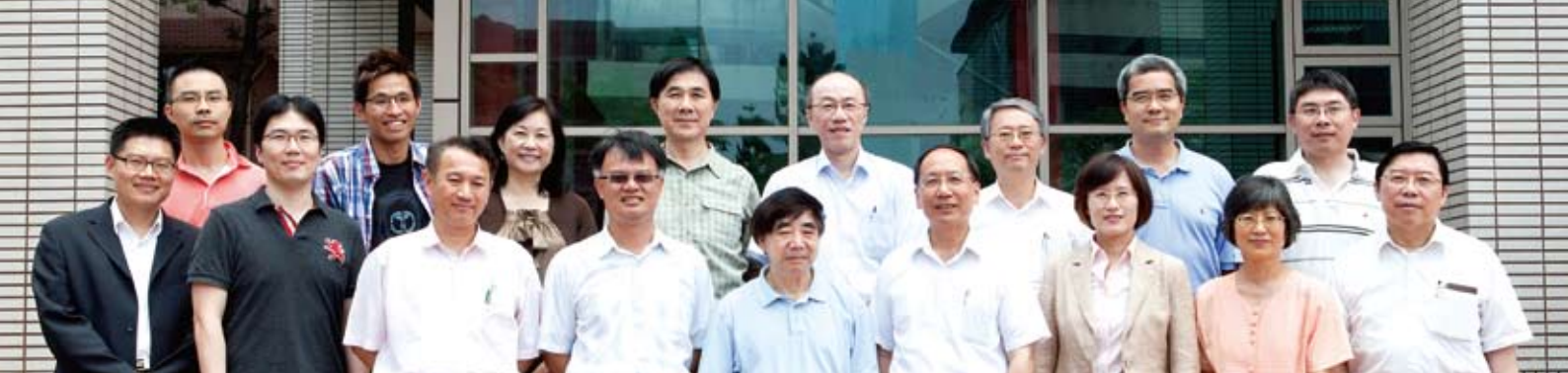
❖ ACTIVITIES

Professors and students of the department participate actively in international and domestic academic events including INFORMS, Chinese Institute of Industrial Engineers, the Ergonomics Society of Taiwan, and the E-Business Management Society of Taiwan. The undergraduate students hold the summer Industrial Engineering Camp for high school students to promote industrial engineering knowledge through seminars, lectures and hands-on activities. The department also organizes workshops for high school teachers to promote the study of industrial engineering. Our undergraduate students are very active in extracurricular activities in which they demonstrate their leadership and teamwork. They can apply for scholarships to study abroad for one year. The senior project course (Topics in I.E.) provides undergraduate students great opportunities to apply their IE knowledge in real settings. Graduate students are involved in research projects, of their choice and have various opportunities to attend conferences and study abroad through exchange programs. Our

faculty conduct research projects sponsored by the National Science Council and other government units and research institutes. We also conduct university-industry collaborative research projects. The department has regularly invited scholars, practitioners, and alumni to share their findings with faculty and graduate students through M.S. and Ph.D. student seminars. The department is actively involved in the College of Engineering's Industrial Liaison Program which strives to maintain the competitive advantages of Taiwan industry through joint industry and university cooperation.

❖ PROSPECTS

The graduates of the IEEM undergraduate and graduate programs are widely engaged in academia, traditional industries, high-tech industries, service industries and government sectors. The academic fields include industrial engineering in general, business administration, information management and automation. High-tech industry includes semiconductor, TFT-LCD, computers, etc. Further, IEEM graduates in traditional and service industries are well accepted, such as in automotive industry, chemical industry, banking, IT, distribution and venture capital. The talent fields could be in manufacturing, production planning, quality control, IE, MIS and strategic planning. The IE graduates perform various job functions including management, analysis, planning and integration. Because enterprise integration activities play an important role in upgrading the competitiveness of industry, IE graduates are highly sought by industry and enjoy bright and well paid career paths.



❖ FACULTY MEMBERS

Lin, James T.	Chair and Distinguished Professor	Ph.D., Lehigh University, U.S.A.	Manufacturing and Logistics, System Simulation, Supply Chain Management, Production Management
Chen, James C.	Professor	Ph.D., University of Wisconsin-Madison (UW-Madison), U.S.A.	Advanced Planning and Scheduling, Lean Production, Supply Chain Management, Business Process Reengineering, Project Management, System Simulation
Chien, Chen-Fu	Distinguished Professor and Secretary General	Ph.D., University of Wisconsin-Madison, U.S.A.	Decision Analysis, Data Mining, Manufacturing Strategy, Modeling and Analysis for Semiconductor Manufacturing, Technology Management and Service System
Chu, Chih-Hsing	Professor	Ph.D., University of California at Berkeley, U.S.A.	Collaborative Design, Geometric Modeling, New Product Development
Hou, Jiang-Liang	Professor and Deputy Secretary General	Ph.D., National Tsing Hua University, R.O.C.	CAD/CAM, Document/Knowledge Management, Logistics Management, RFID Technology and Applications
Hung, Yi-Feng	Professor	Ph.D., University of California at Berkeley, U.S.A.	Production Management, Operations Research, Management of Semiconductor Manufacturing, Supply Chain Management
Hwang, Sheue-Ling	Professor	Ph.D., Purdue University, U.S.A.	Ergonomics, Human-Machine System
Sheu, Dongliang Daniel	Professor	Ph.D., University of California, Los Angeles(UCLA), U.S.A.	Systematic Innovation, Design & Manufacturing Management, Equipment Management, Factory Diagnostics
Song, Whey-Ming Tina	Professor	Ph.D., Purdue University, U.S.A.	Simulation Analysis, Applied Probability & Statistics, Decision Making & Management
Su, Chao-Ton	Tsing Hua Chair Professor	Ph.D., University of Missouri-Columbia, U.S.A.	Quality Engineering, Quality Management, Operations Management, Neural Network Models & Applications
Trappey, Amy J.C.	Distinguished Professor	Ph.D., Purdue University, U.S.A.	Knowledge Engineering, E-Business, E-Automation
Wang, Eric Min-Yang	Professor and Director, Continuing Education Program	Ph.D., Lulea University, Sweden	Ergonomics, Work Study, Aviation Ergonomics, Web-based Consumer Behavior, Human-System Interaction
Wang, Hsiao-Fan	Tsing Hua Chair Professor	Ph.D., Cambridge University, England	Fuzzy Set Theory, Multicriteria Decision Making, Green Value Chain Management
Wang, Mao-Jiun	Tsing Hua Chair Professor and Dean of College of Engineering	Ph.D., State University of New York at Buffalo, U.S.A.	Ergonomics, Digital Human Modeling, Biomechanics
Wen, Ue-Pyng	Professor	Ph.D., State University of New York at Buffalo, U.S.A.	Operations Research, Production Management
Wu, Chien-Wei	Professor	Ph.D., National Chiao Tung University, Taiwan	Quality Engineering and Management, Process Capability Analysis, Statistical Inference and Applications, Six Sigma Methodology and Applications
Yeh, Wei-Chang	Professor	Ph.D., University of Texas at Arlington, U.S.A.	Graph Theory, Soft Computing, Network Reliability
Chen, Kuang-Chen	Associate Professor	Ph.D., Keio University, Japan	Engineering Economics, JIT, TQC
Chu, Yee-Yeen	Associate Professor	Ph.D., University of Illinois, U.S.A.	Engineering and Technology Management, Project Management
Yu, Chi-Yuang	Associate Professor	Ph.D., University of Michigan, U.S.A.	Anthropometry, Work Physiology, Biomechanics, Vision and Color
Chang, Kuo-Hao	Assistant Professor	Ph.D., Purdue University, U.S.A.	Stochastic Optimization, Applied Probability and Statistics, Financial Engineering
Chiu, Ming-Chuan	Assistant Professor	Ph.D., The Pennsylvania State University, U.S.A.	Supply Chain Design and Product Design Integration, Design for X Methods, Service Innovation
Liao, Chung-Shou	Assistant Professor	Ph.D., Dept. Computer Science and information Engineering, National Taiwan University	Combinatorial Optimization, Algorithm Analysis and Applications
Huang, Szu-Hao	Assistant Researcher	Ph.D., National Tsing Hua University, R.O.C.	Computer Vision, Computational Finance, Statistical Machine Learning
Liao, Shinn-Ruey	Instructor	M.S., National Taiwan Normal University, R.O.C.	Manufacturing Engineering, Industrial Safety, Industrial Organization and Management
Chao, Chin-Jung	Adjunct Associate Professor	Ph.D., Purdue University, U.S.A.	Safety Engineering and Management
Yang, Jyh-Shing	Adjunct Associate Professor	Ph.D., Virginia Tech, U.S.A.	Green Management for Industries
Huang, Wun-Hui	Adjunct Assistant Professor	Ph.D., National Taiwan University	Environmental Management, Product Carbon Footprint, Life Cycle Assessment, Eco Design, Environmental Engineering
Hu, Yi-Fan	Adjunct Instructor	Master, National Tsing Hua University, R.O.C.	Accounting, University Fund Management
Wang, Horng-Tzong	Adjunct Instructor	Master, National Tsing Hua University, R.O.C.	Linux \ Database, e-Commerce Website

❖ HONORARY CHAIR PROFESSOR

Fang, Shu-Cherng	Honorary Chair Professor	Ph.D., Northwestern University, U.S.A.	Linear and Nonlinear Programming, Fuzzy Optimization and Decision Making, Soft Computing and Heuristic Methods, Logistics and Supply Chain Management, Telecommunication Networks and L1 Splines
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❖ GUEST PROFESSOR

Gen, Mitsuo	Guest Professor	Ph.D., Kogakuin University, Japan	Fuzzy Logic, Genetic Algorithms , Artificial Neural Network, Scheduling , Communication Network Applications
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