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and management so as to contribute to the development of
Taiwan's industry.

DEPARTMENT PHILOSOPHY

The department emphasizes on utilizing the most
up-to-date knowledge for its teaching and research endeavors. Subject matters presented such as systematic
industrial management, computerization and automation
methodologies, provide students with a variety of skills in the field of industrial engineering and management.
The courses offered complement traditional theoretical engineering training with real world practical applications, providing students with a rich set of job skills. The department’s research, concurrent with the mission of a polytechnic university, is geared towards the current needs of industries, which often results in joint research
and multi-discipline/cooperative research projects with industries.

In addition, in order to aid the development of the students’
global-view and foreign language skills, the department has
instituted the following programs:

- In 1999, an international student exchange program
  with the California Polytechnic State University was
  established. Each year two students are selected to
  study at California Polytechnic State University for a
  one-year period. So far, a total of seven students have
  been through this exchange program. In the future, the
  department will continue to expand international
  education programs such as this one.

- In addition to strengthening student’s foreign language
  skills, with the intention of facilitating the department’s
  international cooperative education programs, two
  professional courses are taught in English each semester.

The department plans to launch a Ph.D. program in the
near future, in order to provide Taiwan with researches of
the highest caliber in the field of industrial engineering and management.

PROFESSIONAL ASPIRATIONS

Graduates can look forward to rewarding careers in the
following fields: In the manufacturing sector, where positions include industrial engineer, production
management engineer, quality control engineer, material control engineer, industrial safety engineer, automation
system design engineer, computerization engineer etc; In
the service sector, where positions include planner, system
analyst, system engineer, and various management
positions. The department strives to provide an education experience that cultivates students to be future leaders in industries.

CURRICULUM

The curriculum focuses on the integration of production
technologies and management knowledge with the
application of information technology to provide the needs
of the industry. The purpose of the curriculum is to
establish professional foundation that will assist students
developing the following engineering abilities:

- Abilities to layout, design, analysis, and setup a
  production and manufacturing system.

- Abilities to solve engineering problems related to
  quality control, statistical control, quality engineering,
  cost and reliability.

- Abilities to apply computer and information
technologies toward industry and operation
  management.

In addition, the curriculum also emphasizes on training
students to acquire the education of foreign language,
communication and negotiating skills, and ethics.

The curriculum puts emphasis on the following features:

- Term Project and Practical Training: Courses are
designed to provide a link between theories and
practical applications to enhance students’ abilities in
solving real world problems. Practical training
encourages teamwork, cooperation, and prepares
students for the demands of the industry.

- Foreign Student Exchange: Programs provide
  opportunities for outstanding students to develop global
  views. Through this exchange program, international
  relations and cooperation can be promoted extensively.

- English Instruction: Several Courses are taught in
  English to provide English-learning environment.

- Industry Outreach: Projects are set up to bring in
  resources from the industry to complement the school’s
  education and research. This provides students with the
  experience and skills necessary to solve real world
  problems faced by industries.

http://www.cytut.edu.tw/~iem
email: iem@mail.cytut.edu.tw
fax: 886-4-23742327
Six major fields of study are available in the curriculum:

- Ergonomics/Human Factors: Integrating the knowledge of physics, physiology, and psychology to improve human performance and reliability in the workplaces. Applications include designing and refining work tools, assessing human performance by experimental methodology, and utilizing computer simulations and motion analysis to assist workstation design and working posture analysis.

- Production Automation and e-Integration: Focusing on implementing knowledge and technologies in computer-integrated manufacturing (CIM) system, such as factory layout, automatic product and process design, production and shop-floor control, inspection and assembly planning, material handling, management information systems, etc. The objective is to develop electronically automated production systems with optimal performance.

- Management Science: Applying mathematical theory and modeling techniques to analyze, verify, validate, and improve the output efficiency of various production systems and the quality of decision-making.

- Quality and Reliability Engineering: Focusing on the implementation of technologies in total quality control, statistical production management, international quality standards, experimental design, quality control engineering, quality cost, reliability engineering, and computer vision, to improve quality of management and production.

- Information systems: Utilizing technologies such as information database systems, expert systems, and decision making algorithms in collecting, organizing, and analyzing information from discrete systems. Providing information technologies for enterprises to make effective decisions, raise output, and improve efficiency.

- Enterprise Management: Emphasize on applying knowledge in industrial management to upgrade the enterprise's capability to cope with competitions and managerial barriers.

LABORATORIES

The department has ten research laboratories, equipped with the best and up-to-date high-tech equipments, for research and instruction purposes.

- Manufacturing Process Practice Laboratory
- Industrial Automation Laboratory
- Computer Integrated Manufacturing Laboratory
- Integration of Enterprise Functions and Creativity Laboratory
- Virtual Manufacturing and Simulation Laboratory
- E-Business Research Laboratory
- Quality Control and Automatic Metrology/Inspection Laboratory
- Work Study and Industrial Safety Laboratory
- Human Factors Laboratory
- Data Processing and Production Management Laboratory

RESEARCH GROUPS

Currently, the department has six major research groups, each of which focuses on a specific research area:

- Production System: Production and Maintenance Scheduling, System Optimization, Reliability Analysis.
- Intelligent Quality Management: Computer Vision, Data Mining, Soft Computing, Quality Information system.

In the past ten years, the department has received from the National Science Council a total of eleven research awards and ninety-two research projects. Funding for these projects totaled NT$33 million. In addition, the department faculty members currently conduct three research projects sponsored by local industries and two other such projects sponsored by the Ministry of Education, a total of NT$6.38 million.
FACULTY BACKGROUND

Hsieh-Ching Chen
- Associate Professor, Department Chair
- PhD, Mechanical Engineering, University of Michigan
- Biomechanics, Ergonomics, Industrial Safety and Hygiene

Ching-Fang Liaw
- Professor, Dean, Office of Research and Development
- PhD, Industrial Engineering, University of Michigan
- Operations Research, Production Scheduling

Chun-Yuan Cheng
- Associate Professor
- PhD, Industrial Engineering, Auburn University
- Applied Reliability Analysis, Statistics, Quality Management

Yuan-Shyi Chiu
- Associate Professor
- PhD, Industrial Engineering and Operations Research, Polytechnic University, New York
- Operations Research, Production/Operation Management, Inventory Control, Management Information System, TPM practices

Nelson N.H. Liao
- Associate Professor, Secretary General, The Office of Secretaries
- MS, Mechanical Engineering, National Cheng Kung University
- Product Development, Strategic Planning, International Marketing

Shun-Sheng Wang
- Associate Professor
- PhD, Individual Interdisciplinary Program, Ohio University
- Manufacturing Processes, Computer Integrated Manufacturing

Chu-Chai Chan
- Associate Professor
- PhD, Industrial Engineering, Iowa State University
- Management Information System, Enterprise Resource Planning, Electronic Commerce

Hong-Dar Lin
- Associate Professor
- PhD, Industrial Engineering, University of Missouri
- Computer Vision, Inspection Automation, Quality Control
Horng-Chyi Horng

- Associate Professor, Vice-Dean, Office of Research and Development
- PhD, Industrial Engineering, Arizona State University
- Computer Integrated Manufacturing, Systems Simulation, Quality Management

Ming Wang

- Associate Professor
- PhD, Industrial Engineering, University of Wisconsin at Madison
- Reliability-Centered Maintenance, Risk Analysis, Decision Analysis, Operations Research

Mingchih Chen

- Associate Professor
- PhD, Industrial Engineering, Texas A&M University
- Operations Research, Reliability Analysis

Chi-Bin Cheng

- Assistant Professor
- PhD, Industrial Engineering, Kansas State University
- Production/Inventory Management, Decision Analysis, Soft Computing

Chin-Hung Liu

- Associate Professor
- PhD, Industrial Engineering, University of Texas at Arlington
- Service Management, Engineering Economy, Quality Systems

Tzong-Ming Cheng

- Assistant Professor
- PhD, Industrial Engineering, Pennsylvania, State University
- Computer Aided Design and Manufacturing, Computer Aided Process Planning, Virtual Manufacturing, Computational Geometry

Te-Hsiu Sun

- Associate Professor
- PhD, Industrial Education, National Changhua University of Education
- Human Resource Management, Organization Theory

Cheng-Lung Lee

- Assistant Professor
- PhD, Mechanical Engineering, State University of New York at Buffalo
- Ergonomics, Industrial Safety and Hygiene
Justin, J.Y., Lin

- Assistant Professor
- PhD, Department of Mechanical and Aerospace Engineering, Arizona State University

Shu-Zon Lou

- Assistant Professor
- PhD, Institute of Biomedical Engineering, National Cheng-Kung University
- Biomechanics, Human Motion Analysis, Human Factor, Biomedical Engineering

Hsin-Chieh Wu

- Assistant Professor
- PhD, Industrial Engineering and Engineering Management, National Tsing Hua University
- Ergonomics, Industrial Safety and Hygiene, Engineering Economics, Quality Management

Chi-Shuan Liu

- Lecturer
- MS, Industrial Engineering, New Jersey Institute of Technology
- Total Production Management, Performance Management
# Postgraduate Courses

<table>
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<tr>
<th>Code</th>
<th>Credits</th>
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<td>IEE1001</td>
<td>1</td>
<td>Seminar (I)</td>
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<tr>
<td>IEE1057</td>
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<td>Advanced Statistical Methods</td>
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<td>IEE1603</td>
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<td>Special Topics on Production Systems (III)</td>
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<td>Neural Networks</td>
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<td>IEF2014</td>
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<td>Computer Vision System</td>
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<td>Advanced Service Operation Management</td>
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<tr>
<td>IEF2049</td>
<td>3</td>
<td>Advanced Computer-Aided Research &amp; Development</td>
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IEE1001 Seminar (I)  
1 Credit  
**Classes:** (3 hrs lec)/wk in Semester 1  
**Assessment:** Speech reports 50%, paper reports 50% (oral: 25%, printed: 25%)  
**Objectives:** This course mainly invites specialists or scholars who major in industrial engineering and management to hold speeches. It is expected to inspire students to get familiar with the research fields.  
**Syllabus summary:** 1. introduction, 2. Invited speech (10 wks), 3. oral presentations (6 wks)

IEE1057 Advanced Statistical Methods  
3 Credits  
**Classes:** (3 hrs lec)/wk in Semester 1  
**Assessment:** Two quizzes (40%), midterm exam (30%), final exam. (30%)  
**Objectives:** This course aims to provide advance statistics theory and some applications of statistical methods. Selected topics are: basic concept of mathematical statistics, regression, analysis of variance (ANOVA), etc.  
**Syllabus summary:** Probability review: random variables and expectation, Special random variables, Distributions of sampling statistics, Parameter estimation: point estimation and interval estimation, Hypothesis test, Regression & ANOVA, ANOVA & goodness of fit tests, Nonparametric analysis.  
**Textbook:** Introduction to Probability and Statistics for Engineers and Scientists, Sheldon M. Ross.

IEE1017 Decision Theory  
3 Credits  
**Classes:** (3 hrs lec)/wk in Semester 1  
**Assessment:** Homework 30%; project 15%; midterm exam. 25%, final exam. 30%  
**Objectives:** An overview of modeling techniques and theories used in decision analysis, including decision trees, influence diagrams, multi-attribute utility models, and Bayesian models.  
**Syllabus summary:** Introduction to decision analysis; application of decision tree and influence diagram; making choice and sensitivity analysis; making decision under uncertainty; value theory & utility theory; multi-attribute model: SMART, SMARTS, and SMARTER models.  

IEE2042 Special Topics on Human Factors (III)  
2 Credits  
**Classes:** (2 hrs lec)/wk in Semester 1  
**Assessment:** Oral presentation 50%, written report 50%  
**Objectives:** This course provides forum and objective comments for reviewed topics that are related to thesis research.  
**Syllabus summary:** Presentation of research work and reviewed paper.  
**Textbook:** Selected journal articles

IEE2043 Special Topics on Virtual Manufacturing System (III)  
2 Credits  
**Classes:** (2 hrs lec)/wk in Semester 1  
**Assessment:** Oral presentation 50%, written report 50%  
**Objectives:** This course provides forum and objective comments for reviewed topics that are related to thesis research.  
**Syllabus summary:** Literature reviews and presentations  
**Textbook:** Selected journal articles

IEE2044 Special Topics on Intelligent Quality Management (III)  
2 Credits  
**Classes:** (2 hrs lec)/wk in Semester 1  
**Assessment:** Paper presentation (70%), term project (30%)  
**Objectives:** Utilizing various sensors, database and data-mining techniques to quality information processing, together with expert systems and soft-computing as support mechanism, to create an integral quality information system that enables quality management with knowledge engineering and software agents.  
**Syllabus summary:** Presentation of research work and paper reviews.  
**Textbook:** Handouts
IEE2045 Special Topics on Global Logistics Management (III)
2 Credits
Classes: (2 hrs lec)/wk in Semester 1
Assessment: Performance and contribution of presentation
Objectives: This course is designed to train students to understand the scope of global logistics management, the research methodology, and writing patterns, to enable the students to find an interested title for their theses. It consists of the followings: 1. Assigned topics on global logistics management, 2. Self-selected topics on global logistics management.
Syllabus summary: Assigned topics on global logistics management (8 wks), Self-selected topics on global logistics management (8 wks).
Textbook: Selected journal articles

IEE2046 Special Topics on Advanced Management Information Systems (III)
3 Credits
Classes: (3 hrs lec)/wk in Semester 1
Assessment: Case studies (50%), oral presentation of article reading (50%).
Objectives: This course introduces the following topics: organizational foundations of information systems, technical foundations of information systems, building information systems, and managing the modern information systems.
Syllabus summary: Case studies and research paper reading & oral presentation.

IEE2048 Special Topics on Production Systems (III)
2 Credits
Classes: (2 hrs lec)/wk in Semester 1
Assessment: Presentation and discussion
Objectives: This course aims to examine the relative research topics in production systems. The topics to be discussed include production scheduling, performance evaluation, reliability analysis, and equipment maintenance. The objective of this course is to help students to have an overview of the state of the art of specific fields, and to improve their innovation and research ability.
Syllabus summary: Literature review, presentation of specific topics, discussion of theses.
Textbook: Selected journal articles

IEE2018 Neural Networks
3 Credits
Classes: (3 hrs lec)/wk in Semester 1
Assessment: Project 40%, midterm exam. 30%, final exam. 30%
Objectives: To teach students how to apply neural network models
Syllabus summary: Introduction to neural network, introduction to backpropagation model, a real case to use backpropagation model, use tool kits to run neural networks, introduction to self-organizing maps model, use tool kits to run self-organizing maps model.
Textbook: Neural Networks, James A. Freeman.

IEF1010 Advanced Statistical Methods
3 Credits
Classes: (3 hrs lec)/wk in Semester 1
Assessment: (Homework, report, and quiz) 50%, midterm exam. 20%, final exam. 30%.
Objectives: To provide the concepts, theories, and applications of probability and statistics.
Syllabus summary: Introduction, Descriptive statistics, probability theory, random variables, useful discrete probability distributions, useful continuous probability distribution, sampling distribution, parameter estimation, hypothesis testing, statistical inferences for two populations, regression and correlation, Chi-square testing

IEF1033 Advanced Quality Management
3 Credits
Classes: (3 hrs lec)/wk in Semester 1
Assessment: Quiz (40%), midterm exam. (30%), final exam. (30%)
Objectives: This course includes the following advanced topics: Introduction of QC, statistical process control, attribute control charts, process capability analysis, acceptance sampling, attribute sampling plans, other QC related topics.
Syllabus summary: History of QC contents of total quality management, review of statistics, statistical process control, variable control charts, attribute control charts, process capability analysis, acceptance sampling, attribute acceptance samplings, standard sampling plan, MIL-STD-105D, other sampling plans, other QC related topics: total quality management, international quality standard certifications, total productive maintenance, quality function deployment.

IEF1034 Organizational Theory and Management
3 Credits
Classes: (3 hrs lec)/wk in Semester 1
Assessment: Presentation 30%, discussion 30%, report 40%.
Objectives: This course provides the following topics: classics of management theories, theories and applications of management, present management topics, and Chinese management philosophy.
Syllabus summary: Classical organization theory, neoclassical organization theory, organizational behavior.
theory, human resource theory, modern structural organization theory, system, contingency, and population ecology organization theory, multiple constituencies/market organization theory, power and politics organization theory, organizational culture theory, Chinese management philosophy, present management topics.

Textbook:

IEF1048 Advanced Computer Aided Design and Manufacturing

Classes: (3 hrs lec)/wk in Semester 1
Assessment: Midterm exam. 30%, final exam. 30%, term project 40%.

Objectives: Students who attend the course will be trained with intensive computation/programming related subjects. Areas such as geometric modeling, computational geometry, geometric algorithm design, and application design are the focus. An ability of converting subjects in the physical world into their equivalent computer representations, and solving real world problems by computer arithmetical and/or logical iterations will be the main purpose of the training.

Syllabus summary: Introduction to the CAD/CAM and its applications, ACIS & scheme extension programming, Computer Graphics & Computer Vision, 2D geometry & graphics, 3D geometry & graphics, curves and surfaces, solid modeling, data base and representation for graphics and solid, introduction to the computational geometry, introduction to the design and analysis of algorithm, design automation, computer-aided process planning (CAPP), paper reviews and presentations.

IEF1001 Research Methods for Ergonomics

Classes: (3 hrs lec)/wk in Semester 1
Assessment: Oral presentations 40%, in-class exams. 40%, homework 20%.

Objectives: To introduce the basics and estimation techniques of ergonomics.

Syllabus summary: Introduction to ergonomics, anthropometry, computer aided ergonomics and workspace design, subjective assessment, task analysis, product assessment and user trials, musculoskeletal disorders, the evaluation of posture and its effects, NMQ, OWAS, REBA, RULA, LUBA, checklist, evaluating work conditions and risk of injury, manual materials handling (physiological, biomechanics, psychophysical, epidemiological approaches), work physiology.

Textbook: Handouts

IEF1007 Marketing High Technology

Classes: (3 hrs lec)/wk in Semester 1
Assessment: Midterm and final exams. 50%, performance of literature review and presentation 50%.

Objectives: This course is designed to nurture the professional managers to be of high-tech industry, to enable the students understanding the insights about how marketing tools and techniques must be adapted and modified for high-tech products and services.

Syllabus summary: Introduction to high technology marketing, strategy and corporate culture in high-tech firms, combining technology and corporate strategy in small high tech firms, smaller firms and Europe’s high tech sectors, relationship marketing: partnerships and alliances, antecedents of commitment and trust in customer-supplier relationships in high tech markets, marketing High Tech: preparation, targeting, positioning, execution.

Textbook:

IEF2009 International Logistics

Classes: (3 hrs lec)/wk in Semester 1
Assessment: Midterm & final exams. 50%, homework assignment and performance of presentation 50%.

Objectives: This course is designed for students to understand about international logistics and the international logistics system. It consists of the followings: 1. concept and management of international logistics system, 2. logistics analysis and system planning, 3. evaluate the performance of different carriers and modes, 4. cases of international trade versus international logistics planning.

Syllabus summary: Introduction to international logistics, logistics management and competitive strategies, international logistics functions and intermediaries, terms of Sale and Terms of payment, ocean ships and shipping, chartering bulk ocean carriers, the ocean liner system, international air transportation, land transportation to and from ports, railway transportation, highway transportation and management, documentation and insurance, international sourcing.

Textbook:
3. Journal papers.

IEF2014 Design of Experiment

Classes: (3 hrs lec)/wk in Semester 1
Assessment: Midterm and final exams. 50%, performance of literature review and presentation 50%.

Objectives: To introduce the basics and estimation techniques of ergonomics.

Syllabus summary: Introduction to ergonomics, anthropometry, computer aided ergonomics and workspace design, subjective assessment, task analysis, product assessment and user trials, musculoskeletal disorders, the evaluation of posture and its effects, NMQ, OWAS, REBA, RULA, LUBA, checklist, evaluating work conditions and risk of injury, manual materials handling (physiological, biomechanics, psychophysical, epidemiological approaches), work physiology.

Textbook: Handouts
Classes: (3 hrs lec)/wk in Semester 1

Assessment: Homework 15%, exam. 50%, project 35% (oral 10%, report 25%)

Objectives: The principles and practice of ANOVA and design of experiments, including randomization, complete and incomplete block design, two/three level factorial design, mixture design, and Taguchi's method.

Syllabus summary: Introduction and Statistical Inference, ANOVA (One Factor), blocking, factorial design, 2k factorial Design, blocking of 2k factorial design, 2k-p factorial design, mixed level factorial design, response surface methods.


IEF2017 Inventory Management Models
3 Credits

Classes: (3 hrs lec)/wk in Semester 1

Assessment: Exam. 50%, homework 25%, paper study 25% (oral 15%, final report 10%)

Objectives: This course introduces deterministic as well as probabilistic inventory models. Topics include EOQ, model with shortage permitted, EPQ (finite production rate model), quantity discount, model with variable demands, resource-constrained multiple product model, Newboy's model, and studies of other specific models.

Syllabus summary: Introduction to Inventory management, deterministic model and its applications, probabilistic model and its applications, studies of other specific models (paper study, oral presentation, and discussion).


References:

IEF2048 Work Physiology
3 Credits

Classes: (3 hrs lec)/wk in Semester 1

Assessment: Reading & report 45%, lab experiment & report 25%, final exam. 30%

Objectives: This course introduces environmental factors that affect performance of humans at work. Students will learn how to improve workers' performance and abilities via training, environmental control, and interface design so as to reduce probability of occupational hazards and injuries. Lectures cover topics of: respiration and circulation, muscle and skeletal system, physical performance and skill work, body dimension and physical training, fatigue and measuring fatigue, working hour and eating habits, shift work, et. al..

Syllabus summary: Introduction, homeostasis, neuromuscular function, sensory organ, muscle strength performance, physical fatigue, properties of electromyography, metabolism, cardiovascular function, pulmonary adaptation to exercise, physical exercise and performance, evaluation of physical performance, physical training, applied work physiology, age and gender effects on exercise performance, work organization, rest allowance, shift work, temperature regulation, lab tour.


IEE1002 Seminar (II)
1 Credit

Classes: (3 hrs)/wk in Semester 2

Assessment: Written reports 60%, oral presentation 40%

Objectives: This course mainly invites specialists or scholars who major in industrial engineering and management to hold speeches. It is expected to inspire students to get familiar with the research fields.

Syllabus summary: Introduction, speeches and discussions, writing practice, field visit, forum.

IEE1007 Advanced Computer Integrated Manufacturing
3 Credits

Classes: (3hrs lec)/wk in Semester 2

Assessment: Midterm exam. 25%, final exam. 25%, midterm report 20%, final report 30%.

Objectives: This course focus on the theories and related issues for industrial and engineering research, development, and automatic production management.

Syllabus summary: Introduction to research and development process, CAD/CAE/CAM, DFMA and other DFX issues, inspection principle and inspection technologies, inspection principle and inspection technologies, material handling, IDEF, MRP, JIT, CAPP from CAD/CAM point of view, group technology & cellular manufacturing, FMS, AMS, Petri Net, robot programming.

Textbook:
2. IDEF, Petri Nets, CAD/CAM/CAE Handouts

IEF1061 Electronic Commerce
3 Credits

Classes: (3 hrs lec)/wk in Semester 2

Assessment: Midterm exam. 30%, final exam. 30%, term project 30%, attendance10%

Objectives: To understand the applications on internet and how internet can benefit the business and to learn the techniques used in e-commerce.

Syllabus summary: e-business model online transaction, internet hardware, software and communication, wireless Internet and m-business, internet security, internet marketing, e-customer relationship management.

IEE1082 Occupational Biomechanics
3 Credits

Classes: (3 hrs lec)/wk in Semester 2
Assessment: Midterm exam. 25%. final exam. 25%, homework & project 50%

Objectives: The course is to introduce basic biomechanics of the musculoskeletal system including the properties of muscle, tendon, ligament and bone. The application in occupation, then, will be presented for understanding the disorder and trauma of musculoskeletal system in the workplace.

Syllabus summary: Occupational Biomechanics as a specialty, the structure and function of the musculoskeletal system, anthropometry in occupational biomechanics, mechanical work-capacity evaluation, bioinstrumentation for occupational biomechanics, occupational biomechanical models, methods of classifying and evaluating manual work, manual materials handling limits, guidelines for seated work, biomechanical considerations in machine control and workplace design, hand tool design guidelines, guidelines for whole-body and segmental vibration.


IEE1083 Multivariate Analysis
3 Credits

Classes: (3 hrs lec)/wk in Semester 2
Assessment: Presentation and project 50%, exam. 50%

Objectives: To introduce the principles and practices of statistical methods for describing and analyzing multivariate data. Literature reviews concerning the application of multivariate methods on industry as well as academy are emphasized through students’ presentation and project writing.


IEE2056 Fuzzy Set Theory
3 Credits

Classes: (3 hrs lec)/wk in Semester 2
Assessment: Midterm exam. 35%, final exam. 35%, project 30%

Objectives: To understand the topics: the theory and applications of fuzzy logic, and softwares of soft computing.


IEF2050 Computer Systems and Human Factors
3 Credits

Classes: (3 hrs lec)/wk in Semester 2
Assessment: Homework 20%, final exam. 30%, project report (oral 15% and paper 35%)

Objectives: To learn the foundations, design practice and advanced topics on Human-Computer Interaction (HCI).

Syllabus summary: Introduction (What is HCI?), the foundations of the human in HCI, the components of the computer in HCI, human-computer interaction design methods, support for designers, evaluation methods.


IEF1021 Computer Vision System
3 Credits

Classes: (3 hrs lec)/wk in Semester 2
Assessment: Homework 40%, paper presentation 10%, mid-term exam. 20%, final project 30%

Objectives: This course covers the basic concepts and applications of important computer vision and automation including: digital image construction, fundamentals of digital image, image transformation, image enhancement, image segmentation, binary image processing, computer vision techniques in industrial applications.


IEF1023 Strategy Management
3 Credits
Classes: (3 hrs lec/wk) in Semester 2

Assessment: Mid-term and final exam (50%), hw assignment (30%), contribution to presentation (20%)

Objectives: Strategic management is the process of examining both present and future environments, formulating the organizational objectives, evaluating alternatives, selecting solution(s), implementing plans, and controlling decisions focused on achieving objectives in the present and future environments. It includes theory statements and cases study in practice. The contents of this curriculum facilitate students to integrate the necessary knowledge and expertise when get involved the activities of strategic planning processes in business.


IEF1027 Advanced Production Management 3 Credits

Classes: (3 hrs lec/wk) in Semester 2

Assessment: Homework (10%), tow quizzes (60%), two oral presentations (15%), final report (15%).

Objectives: This course introduces analytical methods used to support the production and operations management function. The major economic problems discussed, include inventory model analysis, production scheduling and control, forecasting, aggregate planning, project management, scheduling, MRP & JIT, and recent advances in operations planning and control.


IEF103S Strategic Human Resource Management 3 Credits

Classes: (3 hrs lec/wk) in Semester 2

Assessment: Oral presentation (20%), VCD report (20%), papers reading (20%), case study (40%)

Objectives: This course teaches the basic theories and practices of strategic human resource management. Students should own the enough ability of human resource management to be the manager after completing this course.


IEF1042 Special Topics on Human Factors (II) 2 Credits

Classes: (3 hrs lec/wk) in Semester 2

Assessment: Oral presentations 50%, written reports 50%

Objectives: This course provides forum and objective comments for reviewed topics that are related to thesis research.

Syllabus summary: Presentation of research work and reviewed paper.

Textbook: Selected journal articles

IEF1043 Special Topics on Virtual Manufacturing Systems (II) 2 Credits

Classes: (2 hrs lec/wk) in Semester 2

Assessment: Oral presentations 50%, written reports 50%

Objectives: This course provide forum and objective comments for reviewed topics that are related to thesis research.

Syllabus summary: Literature reviews and oral presentations

Textbook: Selected journal articles

IEF1044 Special Topics on Intelligent Quality Management (II) 2 Credits

Classes: (2 hrs lec/wk) in Semester 2

Assessment: Paper presentations (60%), term project (40%)

Objectives: Utilizing various sensors, database and data-mining techniques to quality information processing, together with expert systems and soft-computing as support mechanism, to create an integral quality information system that enables quality management with knowledge engineering and software agents.
Syllabus summary: Paper presentation

Textbook: Handouts and journal papers

IEF1045 Special Topics on Global Logistics Management (II)
2 Credits

Classes: (2 hrs lec/wk) in Semester 2

Assessment: Performance (50%) and contribution (50%) of presentation

Objectives: This course is designed to train students to understand the scope of global logistics management, the research methodology, and writing patterns, to enable the students to find an interested title for their theses. It consists of the followings: 1. Assigned Papers on Global Logistics Management 2. Self-selected Papers on Global Logistics Management.

Syllabus summary: Take turn to present two titles of papers on Global Logistics Management and feedback discuss every week.


IEF1046 Special Topics on Advanced Management Information Systems (II)
2 Credits

Classes: (2 hrs lec/wk) in Semester 2

Assessment: Oral exam and presentations (40%), final report (60%)


Syllabus summary: 1.Organizational Foundations Of Information Systems
2.Technical Foundations Of Information Systems-I
3.Technical Foundations Of Information Systems-II
4.Building Information Systems-I
5.Building Information Systems-II
6.Redesigning the Organization with Information Systems


IEF1047 Special Topics on Production Systems (II)
2 Credits

Classes: (2 hrs lec/wk) in Semester 2

Assessment: Presentation and Discussion

Objectives: This course aims to examine the relative research topics in production systems. The topics to be discussed include production scheduling, performance evaluation, reliability analysis, and equipment maintenance. The objective of this course is to help students to have an overview of the state of the art of specific fields, and to improve their innovation and research ability.

Syllabus summary: 1. Literature review
2. Presentation of specific topics
3. Discussion of theses

Textbook: Selected journal articles

IEF1049 Survey Research Methods
3 Credits

Classes: (3 hrs lec/wk) in Semester 2

Assessment: SPSS practice (40%), thesis analysis (40%), final exam (20%)

Objectives: The contents of this course include: design of research method,development of questionnaire, methods of sampling and statistics.practices of SPSS.thesis writing and analysis. The contents of this course include: design of research method,development of questionnaire, methods of sampling and statistics.practices of SPSS,thesis writing and analysis.


Textbook: Course notes

IEF1050 Numerical Methods
3 Credits

Classes: (3 hrs lec/wk) in Semester 2

Assessment: Midterm (30%), hw & project (40%), final exam (30%)

Objectives: The aim of this course is to give an introduction to some of the basic methods of numerical analysis and to provide the groundwork for the research in the Institute of Industrial Engineering and Management. The objectives is to let the students to be able to: (1)Write simple programmes to do numerical calculations. (2)Find the approximate solution of various mathematical problems. (3)Compare the performance of different methods for approximating the same problem by considering the accuracy of results and effort required to get them. (4)Understand the concept of convergence in numerical methods.


**Textbook:** Gerald/Wheatley 5th , Applied Numerical Analysis, Prentice Hall.

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**IEF2029 Advanced Service Operation Management** 3 Credits

**Classes:** (3 hrs lec/wk) in Semester 2

**Assessment:** Mid-term exam (35%), final report (35%), homework (report) and participation (30%)

**Objectives:**
1. Introduction
2. Designing the Service Enterprise
3. Managing Service Operations
4. Toward World-Class Service

**Syllabus summary:**
1. The Role of Services in an Economy, The Nature of Services
2. Case Study, Service Quality, Service Strategy
3. New Service Development and Process Design
4. Case Study, Internet Service, Forecasting Demand for Services
5. Case Study, Productivity and Quality Improvement
6. Case Study


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**IEF2049 Advanced Computer-Aided Research & Development** 3 Credits

**Classes:** (3 hrs lec/wk) in Semester 2

**Assessment:** Project (25%), midterm (25%), final (30%), others (20%)

**Objectives:** In the era of computerization and digitization, the most upstream work in any industries, research and development, must also enter the computerized world. The purpose of this course is to help students develop the skills in understanding and implementing the theories and practical ideas in the field of computer-aided research, development and management.

**Syllabus summary:**
1. What is research and development(R&D)? The traditional R&D process.
2. The process of computer-aided research, development and management. The techniques behinds CAD/CAE/RE/RP.
3. Design cycles and the difficulties. The application examples of CARD and management in industrials Midterm
4. The importance of PDM. The environment of PDM.
5. The relationship between PDM and ERP. The future trend of CARD and management. Final exam

**Textbook:** Course notes

## Professor Ching-Fang Liaw
Email: cfliaw@mail.cyut.edu.tw

2. The total completion time open shop scheduling problem with a given sequence of jobs on one machine. (NSC, 2002)
3. Scheduling open shops to minimize total weighted tardiness. (NSC, 2001)
4. Scheduling unrelated parallel machines to minimize total weighted tardiness. (NSC, 2001)
5. Scheduling single machine to minimize total weighted earliness and tardiness. (NSC, 2000)

## Associate Professor Chun-Yuan Cheng
Email: cycheng@mail.cyut.edu.tw

1. Estimating parameters of intensity function and maintenance effect for repairable system under an imperfect maintenance model. (NSC, 2004)
2. The study of optimal maintenance policies and maintenance effects under the age-reduction imperfect preventive maintenance. (NSC, 2003)
3. The imperfect preventive maintenance models with the consideration of cost and reliability. (NSC, 2002)
4. The modeling of equipment preventive maintenance policies for high technology industry. (NSC, 2001)
5. The modeling of reliability for equipment preventive maintenance policies. (NSC, 2001)
6. The decision support system of maintenance policies for high technology industry under the total productive maintenance (TPM) system. (NSC, 2000)
7. The study of maintenance scheduling in semiconductor manufacturing. (NSC, 2000)

## Associate Professor Hsieh-Ching Chen
Email: hcchen@mail.cyut.edu.tw

1. A study of the exposure to musculoskeletal hazards in the manufacturing industry. (IOSH, 2004)
3. Evaluation of applying work-field monitoring technology to investigate repetitive strain injuries in upper limbs. (IOSH, 2003)
5. Application and evaluation of the data logger for long period monitoring of onsite work - a case study in manual materials handling. (NSC, 2002)
6. Development of an integrating apparatus for computer pointing devices. (IOSH, 2001)
7. Assistive technology device - development of a fall-detecting and alarm device. (NSC, 2001)

## Associate Professor Yuan-Shyi Chiu
Email: ypchiu@mail.cyut.edu.tw

1. Establishing a TPM training program with WBT usages for small- and medium-sized enterprise in Taiwan. (NSC, 2004)
2. Study the TPM implementation model for machine tool industry in Taiwan. (NSC, 2003)
3. Planning the web-based training (WBT) for total productive maintenance implementation. (NSC, 2002)
4. Establishing a training program for implementation of total productive maintenance (TPM) in Taiwan. (NSC, 2001)
5. Study of TPM implementation model for small- or medium-sized enterprise in Taiwan. (NSC, 2000)

## Associate Professor Shun-Sheng Wang
Email: sswang@mail.cyut.edu.tw

2. Application of Taguchi method in bending process. (NSC, 2001)
Associate Professor Nelson N.H. Liao
Email: secret@mail.cyut.edu.tw

Associate Professor Chu-Chai Chan
Email: ccchan@mail.cyut.edu.tw
1. Studying the approaches of applying the strategic allies to integrate the supply chain after the impacts of WTO. (NSC, 2003)
2. Developing a virtual supply chain for Taiwan’s precision machinery industry. (NSC, 2002)
3. Applying a hierarchical network model to analyze the supply chain of Taiwan’s precision machinery industry. (NSC, 2001)
4. Developing a supply chain performance evaluation model for corporate — a case study for Taiwan precision machinery industry. (NSC, 2000)

Associate Professor Hong-Dar Lin
Email: hdlin@mail.cyut.edu.tw
1. Construction of quality information system based on computer vision for visual defect inspection - a case of surface barrier layer chips. (NSC, 2004)
2. Construction of automated visual inspection and expert systems for color impurity and uneven brightness defects of liquid crystal displays. (NSC, 2003)
3. Studies of multivariate control charts applied to automatic inspection of surface texture- an example of ripple texture in SBL. (NSC, 2002)
4. Inspection and process control of chip corner arc segments of multi-layer ceramic capacitors. (NSC, 2002)
5. Studies of automated film inspection and small-shift process control in printed circuit boards industry. (NSC, 2001)
6. An application of machine vision techniques in automated electrode printing inspection of multi-layer ceramic capacitor process. (NSC, 2000)

Associate Professor Horng-Chyi Horng
Email: cycheng@mail.cyut.edu.tw
1. The development and simulation studies of dispatching rulers for open shops under dual-resource constraints. (NSC, 2003-2004)
2. A decision support system for dispatching multitasking workers in production lines with dynamic events. (NSC, 2002)
3. Simulation metamodelling of the transient behavior of push/pull systems. (NSC, 2001)
4. Simulation analysis and evaluation on the transient behavior of push/pull systems. (NSC, 2000)

Associate Professor Mingchih Chen
Email: mchen@mail.cyut.edu.tw
2. The development of optimal repair/replacement policy with age dependent operating cost. (NSC, 2003)
3. The development of traffic information system for the recreation business. (NSC, 2002)
4. The development of multi-objective scheduling system for the parallel unrelated machines. (NSC, 2001)
5. The optimal maintenance policy with improved replacement. (NSC, 2000)
Associate Professor Chin-Hung Liu
Email: cxl5830@mail.cyut.edu.tw
1. An effect research of QS 9000 quality systems on supply chain management. (NSC, 2002)
2. A research survey of difficulties and evaluation of performance in implementing QS 9000 for the automotive industry in Taiwan. (NSC, 2001)

Associate Professor Ming Wang
Email: mwang@mail.cyut.edu.tw
1. The study of the optimal test interval of (n-1)-out-of-n standby system. (NSC, 2004)

Assistant Professor Cheng-Lung Lee
Email: cllee@mail.cyut.edu.tw
1. A study on ergonomic hazard and control evaluation in operator cab of overhead cranes. (NSC, 2004)
3. The study of worker’s motion during the opening/closing operations for manhole /handhole covers. (NSC, 2001)
4. The dynamic measurement and analysis of body joints : ladder climbing. (NSC, 2000)

Assistant Professor Chi-Bin Cheng
Email: cbcheng@mail.cyut.edu.tw
2. Applying system dynamics and multi-level programming to the design of a compensation plan. (NSC, 2003)
3. Product design optimization: using fuzzy regression analysis and fuzzy multiple objective decision making in QFD. (NSC, 2002)
4. Vehicle routing and scheduling for a frozen food distribution center. (NSC, 2001)
5. Product design optimization: using fuzzy regression analysis and fuzzy multiple objective decision making in QFD. (NSC, 2000)

Assistant Professor Tzong-Ming Cheng
Email: rtmc@mail.cyut.edu.tw
2. A study in the solid model assisted interactive process planner. (NSC, 2002)
3. A study in creativity and creative thinking on engineering drawing. (NSC, 2001)
4. A pilot study in the automatic process design system. (NSC, 2000)

Assistant Professor Justin, J.Y., Lin
Email: jlin@mail.cyut.edu.tw
1. The collaborative development of automatic production, inspection, and quality management system for genuine-like doll eyes – a benchmark study on the application of CCD testability. (Industry Project, 2004)
2. The development of bicycle parts using a brand-new high-strength environmental composite material and its manufacturing process. (NSC, 2003)
4. Researches on light source technology, shape design, assembly method and patents of thin-styled light boxes. (NSC, 2002)
6. A study on the assembly and tolerance of a sandwich cantilever mechanism as an application on an electronic weight meter. (Industry Project, 2001)
8. Planning and consulting on the implementation of product data management system. (Industry Project, 2000)
9. The mechanical system simulation of contact and impact between complex surfaces. (NSC, 2000)

Assistant Professor  Shu-Zon Lou
Email: szlou@mail.cyut.edu.tw

1. The establishment of digital video system for the motion analysis in lifting task. (NSC, 2004)
2. The effects of the wrist guard design on the joint of upper extremity with forward fall. (NSC, 2003)

Assistant Professor  Hsin-Chieh Wu
Email: hcwul@mail.cyut.edu.tw

2. The study of adequate work/rest ratio for heavy work activities. (NSC, 2003)