

The Regional Centre for Manufacturing Systems Engineering

The Regional Centre for Manufacturing Systems Engineering was established in the Faculty of Engineering, with the initial support of the Federation of Thai industries and the British Council, to be the focal point of graduate-level teaching and research in engineering management and manufacturing systems engineering in the South-East Asian region. Since the first group in January 1996, the Centre has graduated several hundred master degree graduates in its unique dual-degree programme with the University of Warwick.

Established in 1996 the Regional Centre for Manufacturing Systems Engineering offers a postgraduate programme leading to the degree of Master of Engineering in Engineering Management. It is based on the successful model at the University of Warwick which is supported by a number of leading international companies. The current programme in Thailand is supported by The Federation of Thai industries. It allows the transfer of leading edge technologies and manufacturing strategies to Thai companies.

Academic staff from both the Warwick Manufacturing Group and Chulalongkorn University contribute to teaching of the programme. The Master of Engineering award is granted by Chulalongkorn University and the Master of Science award is granted, concurrently, by the University of Warwick providing truly international credibility.

ENGINEERING MANAGEMENT (International Program)

NAME OF THE DEGREE

: Master of Engineering
: M. Eng.

ADMISSION

1. The applicant must hold a Bachelor's Degree of Engineering or equivalent with the minimum TOEFL score of 550 or with the certificate of proficiency in English (IELTS 6.0) from the British Council or with WELT B,C,C.

2. The Applicant must meet other qualifications set by the regulations of the Graduate School, Chulalongkorn University, which will be annually announced. Otherwise the applicant must earn the approval by the graduate study committee of the Faculty of Engineering.

DEGREE REQUIREMENTS

Number of credits for curriculum not less than 42 credits: 4 credits for required courses, (non-credit) 24 credits for elective courses, 18 credits for thesis.

PROFESSORS :

Parames Chutima, Ph.D. (Nottingham)

ASSOCIATE PROFESSORS :

Damrong Thaveersaengsakuthai,
B.Eng. Hons. (Chula)
M.Eng. (A.I.T)

Jeerapat Ngaoprasertwong,
B.Eng. Hons. (Chula)
M.S. M.A. (Iowa)

Manit Thongprasert, Ph.D. (Texas tech.)
Parames Chutima, Ph.D. (Nottingham)

Viboon Sangveraphunsiri,
Ph.D. (Georgia Tech.)

ASSISTANT PROFESSORS :

Boonwa Thampitakul, B.E. (N.S.W.)
M.S. (Iowa)
D.E.A., Docteur de 3^e
cycle (Sciences de
gestion) AIX-
SEILLE III)

Manop Reodecha,
B.E. Hons
M.Eng. Sc.
(Newcastle)
Ph.D. (North
Carolina State)

Napassavang Osothsilp
Ph.D. (Wisconsin-
Madison)
Ms. (wisconsin-adison)
B.Eng. (Chula)

Prasert Akkharapathomphong,
M.Eng. (Keio)

Praveena Charalitsngse Ph.D. (Florida)
Rein Boondiskulchok,
B.Eng. Hons. (Chula)
M.Eng. D.Eng. (AIT)

Suthas Ratanakuakangwan,
License es Sciences,
Maitrise es Sciences,
Economiques
(D.E.S.S Toulouse)

Somchai Puajindanetr,
Ph.D. (Imperial
London)

INSTRUCTORS :

Jirdsak Tscheikuna, Ph.D.
(OklahomaState)

Somboon Chongchaikit,
B. Eng. Hons
M.Eng. (Chula)
D.E.S. (ESE France)
Dr.Ing. (Electronique)
(Paris XI)

COURSE REQUIREMENTS

	<i>1) Required Courses 2 credits</i>	
2163601	Fundamentals of Integrated Engineering Business Management	2(2-0-6)
	<i>2) Approved Electives 10 credits</i>	
2163610	Service Support Technologies	2(2-0-6)
2163620	Logistics and Operation Management	2(2-0-6)
2163630	Business Strategy and Strategic Management	2(2-0-6)
2163631	Project Planning Management and Control	2(2-0-6)
2163632	Organisations, People and Performance	2(2-0-6)
	<i>3) Elective Courses 10 credits</i>	
Technology		
2163611	Computer Aided Design and Manufacture	2(2-0-6)
2163612	Automation and Robotics	2(2-0-6)
2163613	E-Commerce Technologies	2(2-0-6)
2163614	Metallic Materials: Properties Processes and Applications	2(2-0-6)
6163615	Polymer Materials: Processes and Applications	2(2-0-6)
2163616	Information and Communication Technologies	2(2-0-6)
2163617	Manufacturing Process Technology	2(2-0-6)
2163618	Design for the Environment	2(2-0-6)
Operation		
2163621	Supply Chain Management	2(2-0-6)
2163622	Technology Management	2(2-0-6)
2163623	Product Design and Development Management	2(2-0-6)
2163624	Quality Management and Techniques	2(2-0-6)
2163625	Applied Statistical Methods	2(2-0-6)
Management		
2163633	Operations Strategy for Industry	2(2-0-6)
2163634	Strategic Marketing	2(2-0-6)
2163635	Information System Strategy	2(2-0-6)
2163636	Innovative Strategy	2(2-0-6)
2163637	Financial Analysis and Control Systems	2(2-0-6)
2163638	Financial Strategy	2(2-0-6)
2163639	Management of Change	2(2-0-6)
2163640	International Joint Venture	2(2-0-6)
2163641	Establishing New Business	2(2-0-6)
2163642	Business Environment and Economics	2(2-0-6)
General		
2163691	Advanced Topics in Engineering Management I	2(2-0-6)
2163692	Advanced Topics in Engineering Management II	2(2-0-6)
2163693	Advanced Topics in Engineering Management III	2(2-0-6)

2163694	Advanced Topics in Engineering Management IV	2(2-0-6)
2163695	Advanced Topics in Engineering Management V	2(2-0-6)
2163696	Advanced Topics in Engineering Management VI	2(2-0-6)
	3) Thesis	
2163813	Thesis	18 credits

COURSE DESCRIPTIONS

2163601 Fundamentals of Integrated Engineering Business Management 2(2-0-6)

Introduction to engineering business management; manufacturing and engineering industry today; international challenge; the change of management process; IEBM programmer rationale; introduction to strategic planning tools; introduction to manufacturing operations strategy; manufacturing operations strategy formulation process; systems approach; product strategy and innovation; role of technology; tools and techniques of operational management.

2163610 Service Support Technologies 2(2-0-6)

The Service Support Technologies looks at the technologies available to both deliver and support service. It will consider diagnostic tools both in terms of healthcare diagnostics and machinery diagnostics. The secondary level of technological support in terms of information systems and global business implications will also be covered.

2163620 Logistics and Operation Management 2(2-0-6)

The logistics function in the supply chain; establishing a logistics strategy; customer and supplier relationship; operations planning and control; material requirements planning; just-in-time philosophies; the use of computers in logistics and operations management; distribution networks; measuring logistics performance.

2163630 Business Strategy and Strategic Management 2(2-0-6)

Introduction and International economic background; economic and business trends in the Asia Pacific area; the strategic management process; analysis of the external environment; analysis of the internal environment; Alternative approaches to strategic thinking; financial aspects of strategic management; organizational and human resource aspects; global business strategies; Cross-cultural aspects of strategic management; Case studies.

2163631 Project Planning Management and Control 2(2-0-6)

Project organization, planning and content analysis; estimating; and tendering; budgeting and cost control; network planning; project monitoring; partnership/contractor relationships.

2163632 Organisations People and Performance
2(2-0-6)

Company organization, cultures and management styles; payment schemes; trade unions and industrial relations; legislation; the role of the individual, career and personal development; technological implications; manpower and succession planning, selection and motivation; communications; conflicts between company and individual objectives.

2163611 Computer Aided Design and Manufacture
2(2-0-6)

Basis CAD concepts; 3-D concepts; 2 ½ axis NC. Programming; finite element analysis; surface modeling; coding and classification; cell control; computer aided inspection; 3 axis NC. Programming; computer aided process planning; parametric; knowledge based systems in CAD/CAM; CAD/CAM-design to manufacture demonstration; role of CAD/CAM; introduction to computer integrated manufacture (CIM); emerging technologies; case study.

2163612 Automation and Robotics **2(2-0-6)**

Principles and implementation of automatic and robotics systems; automatic process control logic and sequence; automated materials handling and storage; economic justification for AMT projects; flexible manufacturing systems; vision engineering; robots at work; importance of design in automation; case studies, syndicate exercises and a visit.

2163613 e-Commerce Technologies **2(2-0-6)**

E-Commerce in perspective; the application of E-Commerce tools and techniques; Internet, Intranet and Extranet; communication and network technologies; privacy and security; collaborative product commerce; data warehouses, mining and knowledge engineering; evaluation of e-commerce in functional operations; legal implications; virtual enterprises; the future of e-commerce technologies.

2163614 Metallic Materials: Properties Processes and Applications **2(2-0-6)**

The structure/property relationship - mechanical properties of metals and alloys, methods of measuring and increasing them, and their influence on process ability and application; Properties and selection of steels; heat treatment; effect of alloying; Properties and selection of cast irons; introduction to tool materials; properties and selection of non-ferrous metals; failure investigation; introduction to engineering ceramics; electronic and optical materials; metal matrix composites; introduction to primary production processes.

2163615 Polymer Materials: Processes and Applications **2(2-0-6)**

Polymers as an engineering material; manufacturing technologies for polymeric materials; economics of material selection and aspects of environmental considerations; computer simulation: component, tooling and manufacturing techniques; high and low volume production manufacturing technologies; plastic component market opportunities; case study; laboratory visit

2163616 Information and Communication Technologies
2(2-0-6)

Systematic project management methodology; data modeling; database design and management; computer architectures and operating environments; system development tools and programming; data communication and network technologies; internet and world-wide-web technologies; emerging technologies; human aspects of systems implementation.

2163617 Manufacturing Process Technology **2(2-0-6)**

An appreciation of the application capabilities and limitation of primary and secondary manufacturing processes.

2163618 Design for the Environment **2 (2-0-6)**

Train a new generation of product designers and managers who will play a major role in the move towards sustainable development. Integrate the needs of the customer with those of the environment to ensure that the society can reach a more balanced trade-off between economy and environment. An appreciation of sustainable business practice, energy, design, materials and life cycle analysis is key. New eco-friendly products and clean production technologies need to be developed and utilised in our drive towards sustainable development at national and global level.

2163621 Supply Chain Management **2 (2-0-6)**

Meaning of supply chain management; designing the supply base and selecting suppliers; supply chain relationships; measuring suppliers and the supply chain; supplier development and continuous improvement; organization design; technology in supply chain management.

2163622 Technology Management **2 (2-0-6)**

Technology and its importance; case studies on the benefits/consequences of adopting/ignoring technology; how business needs and product strategy drive technological requirements; evaluation of capability of the competitors, companies to deliver technology: SWOT and benchmarking exercises; formulating company technology strategy - accessing technology; justifying technological investment - persuading decision makers; tools and techniques for assessing technology and delivering it at acceptable risk; implementation of strategy for technological change; future opportunities and developments.

2163623 Product Design and Development Management **2(2-0-6)**

The role of the marketing organization; methods to turn concepts into engineering solutions; content of a design specifications; sources of costs associated with introduction of a new product; prevention of defects and scrap of rejects during manufacture and assembly; cost of ownership concept; design for simple maintenance.

2163624 Quality Management and Techniques 2 (2-0-6)

Management for Quality; Motivation and Employee Involvement; Economics of Quality; Design for Quality; Basic Tools of Quality Improvement; Variability in Processes; Product Liability; Quality Systems; Failure Modes, Effects and Criticality Analysis; Quality Function Deployment.

2163625 Applied Statistical Methods 2 (2-0-6)

Descriptive statistics; probability; distributions: binomial, Poisson, exponential and normal: exploratory data analysis; sampling and testing; analysis of variance; regression analysis; goodness of fit; distribution-free (non parametric) statistics; design of experiments; statistics on computer.

2163633 Operations Strategy for Industry 2 (2-0-6)

The company and corporate strategy; the market requirements; products and product design; subcontracting, sourcing, make and buy decision; technology, processes, plant replacement and investment; total quality; manufacturing operations organization; diversification factoring and acquisition; joint venture and collaboration; human factors; company structure; external factors; financial controls.

2163634 Strategic Marketing 2 (2-0-6)

Introduction to marketing; types of market; marketing research and analysis; managing the marketing mix regarding product, price, place and promotion as well as the impact on it of information technology; strategic market planning prerequisites and methods and management.

2163635 Information System Strategy 2 (2-0-6)

Information systems evolution; data and information presentation and management; business activity and information analysis; organizational implications; information systems architecture and selection; strategy development; legal and financial implications; industrial sector comparisons.

2163636 Innovative Strategy 2(2-0-6)

Environments for learning and innovation; The barriers to creative thinking; Understanding mind-sets through a manufacturing strategy role play; the design/development of business processes for innovation; an innovation strategy workshop; approaches to business strategies; the world of systems thinking; a business systems simulation; national issues for innovation policy; leadership styles; development of innovation action plans.

2163637 Financial Analysis and Control

Systems 2(2-0-6)

Financial objectives; profitability and liquidity; analysis and interpretation of published financial statements; cost behavior analysis; profit/volume analyses; budget

preparation and control; standard costing; divisional/segmental performance measurement; capital investment; risk and uncertainty analysis; effects of inflation and taxation; introduction to computer-based financial modeling.

2163638 Financial Strategy 2(2-0-6)

Capital expenditure appraisal and present value concept; taxation. Inflation and life cycle costing; financial modeling; risk and return on investment; sources of finance and market efficiency; mergers and acquisitions; international financial markets.

2163639 Management of Change 2(2-0-6)

Concept and consideration of mapping the organization, people's used in reaction to changes, concepts and consideration of individual territories, journeys to success, tools and techniques, major change programs, planning and implementing change, model for change, continuous learning and change, planning for the future

2163640 International Joint Ventures 2(2-0-6)

Collaboration strategy, concepts and types of collaborative venture, international joint venture management, guidelines for practice and culture, low and finance, negotiation and international joint venture exercises.

2163641 Establishing New Business 2(2-0-6)

Explores the personal motivators and implementation issues in setting up a new business. It explores options on the types of businesses, and the resulting legal requirements and operational regulations that may apply and how these impact on the operational structure of the business. It explores the personal compromises that will be required.

2163642 Business Environment and Economics 2(2-0-6)

Economics data; econometrics; demand/supply and the market; national and international level of economic activity; microeconomic at industry level; markets and efficiency; market failure; industry structure.

2163691 Advanced Topics in Engineering Management I 2(2-0-6)

Study of current interesting topics and new development in engineering management I.

2163692 Advanced Topics in Engineering Management II 2(2-0-6)

Study of current interesting topics and new development in engineering management II.

2163693 Advanced Topics in Engineering Management III 2(2-0-6)

Study of current interesting topics and new development in engineering management III.

2163694 Advanced Topics in Engineering Management IV 2(2-0-6)

Study of current interesting topics and new development in engineering management IV.

- 2163695 Advanced Topics in Engineering Management V 2(2-0-6)**
Study of current interesting topics and new development in engineering management V.
- 2163696 Advanced Topics in Engineering Management VI 2(2-0-6)**
Study of current interesting topics and new development in engineering management VI.
- 2163813 Thesis 18 Credits**