For students enrolled since the first semester 2016 academic years and onward

Department of Industrial Engineering

Engineering Management (International Program)

Program Master of Engineering Program in Engineering Management (International Program)

Degree Master of Engineering (Engineering Management), M.Eng. (Engineering Management)

Plan A Option 2:

Total credits required: minimum 36 credits

(1) Major courses: minimum 24 credits

- Seminar: 2 credits

01222597	Seminar	1,1

- Major requirements: 7 credits

01222531	Performance Measurement, Assessment, and Analysis	3(3-0-6)
01222542	Management for Engineers	3(3-0-6)
01222591	Research Methodology in Engineering Management	1(1-0-2)

- Major electives: minimum 15 credits

Choose graduate electives at least 15 credits from the list below.

01206513	Applied Quantitative Sciences in Industrial Engineering	3(3-0-6)
01206534	Simulation Modeling and Analysis	3(3-0-6)
01206542	Applied Data and Regression Analysis	3(3-0-6)
01206555	Engineering Project Management	3(3-0-6)
01206562	Production Planning and Inventory Control	3(3-0-6)
01206563	System Engineering and Life Cycle Management	3(3-0-6)
01206565	Maintenance Management	3(3-0-6)
01222521	Total Quality Management	3(3-0-6)
01222522	Supply Chain Design and Management	3(3-0-6)
01222523	Manufacturing Systems Management	3(3-0-6)
01222524	Engineering Entrepreneurship	3(3-0-6)
01222525	Production Planning and Management	3(3-0-6)
01222541	Engineering Management Information System	3(3-0-6)
01222543	Economic Analysis for Engineering and Managerial Decision Making	3(3-0-6)
01222544	Financial and Managerial Accounting for Engineers	3(3-0-6)
01222545	Cost Management for Engineers	3(3-0-6)

01222546	Safety and Hazard Management	3(3-0-6)
01222596	Selected Topic in Engineering Management	3(3-0-6)
01222598	Special Problems	3(3-0-6)

(2) Thesis: minimum 12 credits

01222599	Thesis	1-12

Plan B:

Total credits required: minimum 36 credits

(1) Major courses: minimum 30 credits

- Seminar: 2 credits

01222597	Seminar	1,1

- Major requirements: 7 credits

01222531	Performance Measurement, Assessment, and Analysis	3(3-0-6)
01222542	Management for Engineers	3(3-0-6)
01222591	Research Methodology in Engineering Management	1(1-0-2)

- Major electives: minimum 21 credits

Choose graduate electives at least 21 credits from the list below.

01206513	Applied Quantitative Sciences in Industrial Engineering	3(3-0-6)
01206534	Simulation Modeling and Analysis	3(3-0-6)
01206542	Applied Data and Regression Analysis	3(3-0-6)
01206555	Engineering Project Management	3(3-0-6)
01206562	Production Planning and Inventory Control	3(3-0-6)
01206563	System Engineering and Life Cycle Management	3(3-0-6)
01206565	Maintenance Management	3(3-0-6)
01222521	Total Quality Management	3(3-0-6)
01222522	Supply Chain Design and Management	3(3-0-6)
01222523	Manufacturing Systems Management	3(3-0-6)
01222524	Engineering Entrepreneurship	3(3-0-6)
01222525	Production Planning and Management	3(3-0-6)
01222541	Engineering Management Information System	3(3-0-6)
01222543	Economic Analysis for Engineering and Managerial Decision Making	3(3-0-6)
01222544	Financial and Managerial Accounting for Engineers	3(3-0-6)
01222545	Cost Management for Engineers	3(3-0-6)
01222546	Safety and Hazard Management	3(3-0-6)
01222596	Selected Topic in Engineering Management	3(3-0-6)
01222598	Special Problems	3(3-0-6)

(2) Independent Study: 6 credits

01222595	Independent Study	3,3

Course Description

01222511 Applied Statistics for Engineers **3(3-0-6)**

Discrete probability distributions, continuous probability distributions, random sampling, hypothesis testing, estimation methods, simple linear regression analysis, multiple linear regression analysis, nonparametric methods, and design of experiment.

01222521 Total Quality Management **3(3-0-6)**

Introduction to quality management, leadership in quality, information and data analysis, strategic quality planning, leadership through quality, human resource development and management, keys to continuous quality improvement, statistical process control, benchmarking, customer focus and satisfaction, buyer-supplier relationship in TQM.

01222522 Supply Chain Design and Management **3(3-0-6)**

Distribution strategy, procurement and manufacturing strategies, information network, planning and scheduling, inventory management, transportation management, warehousing, material handling, performance and financial assessment.

01222523 Manufacturing Systems Management **3(3-0-6)**

Introduction to manufacturing systems, types of manufacturing systems, design and operations of manufacturing systems, planning and control of manufacturing systems, group technology, computer integrated manufacturing, Toyota production system, internet applications in manufacturing.

01222524 Engineering Entrepreneurship **3(3-0-6)**

Introduction, nature and importance of entrepreneurship in developing and transferring technology, understanding aspects of entrepreneurship, innovation and entrepreneurship processes, business opportunities, initial screening and evaluation of innovation opportunities, and development of a business plan.

01222525 Production Planning and Management **3(3-0-6)**

Roles of manager in production planning and management, principle of production planning, forecasting, aggregate production planning, inventory management, material requirement planning, capacity planning, scheduling.

01222526 Production and Industrial Business Process Simulation **3(3-0-6)**

Queuing models for industrial business process modeling, production and business model building, random number generation, random variate generation, input modeling, verification and validation of simulation models, output analysis.

01222527 Project Management for Engineering Management **3(3-0-6)**

Selecting projects and project managers, project planning management, budgeting and cost estimation, scheduling, resource management and allocation, monitoring and information systems, project control management, project auditing.

01222528 Contemporary Topics in Quality Management **3(3-0-6)**

New practices in quality management, creation of value-chain and brand value, attention to customer requirements, satisfaction and delight, roles of technology in effective quality management, quality management practices in service industries, including service before-, during-, and after-sales: warranty management, quality management within the context of strategic planning.

01222529 Simulation Applications in Engineering Management **3(3-0-6)**

Random number theorem, input analysis, and simulation building by computer program technique in order to apply to the engineering management operations in industry and organization. Result analysis from simulation model and statistical values measure with using computer program.

01222531 Performance Measurement, Assessment, and Analysis **3(3-0-6)**

Emphasis on measurement and assessment of performance at the organizational, functional, and individual level, applications of tools and techniques to establish a set of performance, measures of key performance indicators in a ratio format, discussion includes auditing into quality of measures used to reflect the performance level, presentation of performance analysis.

01222541 Engineering Management Information System **3(3-0-6)**

Roles of managers in information technology, using technology to transform the organization, interpreting and understanding information, frameworks for information technology, impact of information technology, impact of information technology on the organization, database management, communications, information technology architectures, system analysis and design.

01222542 Management for Engineers **3(3-0-6)**

Planning, coordination, and analysis in management, understanding of pragmatic aspects of key theories and concepts for better management, performing management functions and designing a management process.

01222543 Economic Analysis for Engineering and Managerial Decision Making **3(3-0-6)**

Decision making in engineering and management, cost concepts for decision making, engineering economic analysis including discounted cash flows methods, application of optimization techniques as in equipment replacement, capital budgeting, and capacity expansion, cost and profit relationships, effects of inflation and tax, and analysis of risk and uncertainty for managerial decision making.

01222544 Financial and Managerial Accounting for Engineers **3(3-0-6)**

Introduction to accounting, principles of accounting, financial reports, financial-transactions analysis, financial-statement analysis, budgeting, variance analysis, and economic analysis of short-term decisions.

01222545 Cost Management for Engineers **3(3-0-6)**

Introduction on cost management and its concepts, activity-based costing and management, cost management planning, including cost estimation, cost-volume-profit analysis, master budgeting and capital budgeting, cost management systems, including job costing, process costing, and cost allocation, operational control through flexible budgeting and standard costing, and management control through performance evaluation including design of management control systems for evaluation.

01222546 Safety and Hazard Management **3(3-0-6)**

Vision for safety and hazard management, safety and ethics for engineers and managers, business strategy and safety policy, safety management system, organization and personnel for safety, training and personnel development, leadership, safety information system, safety management standards and assessment.

01222547 Risk Analysis for Engineers **3(3-0-6)**

Reliability and risk assessment, decision and cost-benefit analysis. Decision making under uncertainty. Balancing risks and involving human safety, potential environmental effects, and large financial and technological uncertainties.

01222591 Research Methodology in Engineering Management **1(1-0-2)**

Research principles and methods in Industrial Engineering problem analysis for research topic identification data collecting for research planning, identification of samples and techniques, research analysis, result explanation and discussion, report writing, presentation and preparation for journal publication.

01222595 Independent Study **3**

Perform an independent study on interesting topic at the master's degree level, compile into a written report.

01222596 Selected Topics in Engineering Management **3(3-0-6)**

Selected topics in engineering management at the master's degree level, topics are subject to change in each semester.

01222597 Seminar **1**

Presentation and discussion of interesting topics in engineering management at the master's degree level.

01222598 Special Problems **3(3-0-6)**

Study and research in engineering management at the master's degree level and compile into a written report.

01222599 Thesis **1-12**

Research at the master's degree level and compile into a thesis.

01206513 Applied Quantitative Sciences in Industrial Engineering 3(3-0-6)

Mathematical models and methods for decision making in analysis, design and control of industrial production systems, mathematical programming models, probabilistic and stochastic models, basic industrial data analysis and forecasting using statistical methods and manufacturing simulation under uncertainty.

01206534 Simulation Modeling and Analysis 3(3-0-6)

Discrete event simulation. Development of computer simulation models. Model validation and verification. Random number generation. Input data analysis. Estimation theory and goodness of fit test.

01206542 Applied Data and Regression Analysis 3(3-0-6)

Reviews of descriptive statistics, simple linear least squares, multiple regression, polynomial regression, stepwise regression, multicollinearity, correlation, nonlinear, least squares and transformations, techniques of application with use of computer packages.

01206555 Engineering Project Management 3(3-0-6)

Organization structures of project management, applying network Analysis in planning and scheduling of each project activity with consideration of total time, cost, labor and other related resources, data base systems for project administration, capital budgeting, control and operations techniques for meeting project due dates, project management standard, virtual project management and global project management.

01206562 Production Planning and Inventory Control 3(3-0-6)

Overview and importance of production planning and control, modeling techniques, problem-solving methodologies, alternative production systems, real-world manufacturing planning and control cases.

01206563 Systems Engineering and Life Cycle Management 3(3-0-6)

Principles of system engineering, system life cycle, system design process, designs affecting operational feasibility, life cycle costing, designs for reliability, maintainability, human factors supportability and economic feasibility, application of quantitative methods for system engineering management.

01206565 Maintenance Management 3(3-0-6)

Principles and models of maintenance, processes for analyzing requirements of business environments, safety and quality standards, system analysis, maintenance failure and condition monitoring, planning and control, inventory selection and control, human factors and organization, information flows and computer control, overall equipment effectiveness, total productive maintenance system for maintenance.