Study Plan for the Master Degree
In Industrial Engineering / Management

(Thesis Track)

Plan no.			2005	T

A. GENERAL RULES AND CONDITIONS:
1. This plan conforms to the regulations of the general frame work set by The Faculty of Graduate Studies.
2. Specialties allowed to enroll in this plan are according to the following admission priorities:
   a. Holders of a Bachelor in Industrial Engineering.
   b. Holders of a Bachelor in any other field of Engineering.
   c. Holders of a Bachelor in Information Technology, or Pharmacy, or Statistics, or Mathematics, or Food Processing, or Business Administration.

B. SPECIAL CONDITIONS: N/A

C. The study plan consists of (33) credit hours as follows:
   1. Obligatory Courses: (18) credit hours as follows:

Course no.	Course title	Cr. Hrs.	Pre-requisite
0906701	Operations Research	3	-
0906702	Applied Engineering Statistics	3	-
0906703	Industrial Quality Control	3	906702
0906704	Production Planning and Control	3	906701
0906705	Human Factors	3	906702
0906708	Systems Simulation	3	906702

   2. Elective courses: (6) credit hours to be chosen from the following:

Course no.	Course title	Cr. Hrs.	Pre-requisite
0906706	Computer Integrated Manufacturing	3	906704
0906709	Information Systems Analysis and Design	3	-
0906710	Engineering Economy	3	-
0906711	Project Management and Network Models	3	-
0906712	Artificial Intelligence	3	-
0906713	Methods Engineering and Work Measurement	3	-
0906725	Knowledge Management	3	-
0906726	Special Topics in Engineering Management	3	906704
0906728	Industrial Health and Safety Engineering	3	-

   3. Master Thesis (9) credit hours (0906799).

Study Plan for the Master Degree
In Industrial Engineering / Management

(Non-Thesis Track)

Plan no.			2005	C

A. GENERAL RULES AND CONDITIONS:
1. This plan conforms to the regulations of the general frame work set by The Faculty of Graduate Studies.
2. Specialties allowed to enroll in this plan are according to the following admission priorities:
   a. Holders of a Bachelor in Industrial Engineering.
   b. Holders of a Bachelor in any other field of Engineering.
   c. Holders of a Bachelor in Information Technology, or Pharmacy, or Statistics, or Mathematics, or Food Processing, or Business Administration.

B. SPECIAL CONDITIONS: N/A

C. The study plan consists of (33) credit hours as follows:
1. Obligatory Courses: (24) credit hours as follows:

Course no.	Course title	Cr. Hrs.	Pre-requisite
0906701	Operations Research	3	-
0906702	Applied Engineering Statistics	3	-
0906703	Industrial Quality Control	3	906702
0906704	Production Planning and Control	3	906701
0906705	Human Factors	3	906702
0906706	Computer Integrated Manufacturing	3	906704
0906708	Systems Simulation	3	906702
0906710	Engineering Economy	3	-

2. Elective courses: (9) credit hours to be chosen from the following:

Course no.	Course title	Cr. Hrs.	Pre-requisite
0906709	Information Systems Analysis and Design	3	-
0906711	Project Management and Network Models	3	-
0906712	Artificial Intelligence	3	-
0906713	Methods Engineering and Work Measurement	3	-
0906721	Design and Analysis of Production Systems	3	-
0906725	Knowledge Management	3	-
0906726	Special Topics in Engineering Management	3	906704
0906728	Industrial Health and Safety Engineering	3	-
0906737	Product Development	3	-

3. Passing a comprehensive exam (0906798).

COURSE DESCRIPTION

(0906701) OPERATIONS RESEARCH   **(3 Credit Hours)**

Operations research methodology with emphasis on application to large-scale systems. Algebraic and Numerical techniques for computational error reduction. Advanced topics in linear programming, non-linear programming, and sensitivity analysis. Practical case studies and applications.

(0906702) APPLIED ENGINEERING STATISTICS   **(3 Credit Hours)**

Advanced topics on probability theory, theory of statistical inference, estimation, sampling distribution, tests of hypothesis, linear and non - linear regression. Analysis of variance and design of experiments. Case studies.

(0906703) QUALITY CONTROL   **(3 Credit Hours)**

Total Quality Management. Acceptance sampling and control charting by both attributes and variables. Statistically and economically-based treatments of sampling plans and control chart design, analysis & design of sampling under inspection and measurement errors. Experimental design and analysis of variance in quality control.

(0906704) PRODUCTION PLANNING AND CONTROL   **(3 Credit Hours)**

Application of scheduling theory in the production system. Analytical models in decision making, Aggregate production planning, Master production scheduling, MRPI, MRPII, JIT. Probabilistic inventory models.

(0906705) HUMAN FACTORS   **(3 Credit Hours)**

The course introduces the application of human physical and mental processing to motion and time study for the optimization of man-machine systems. Design of commonly used prediction and training systems under random and constant demands. The statistical distribution of the population concerning manual skills. The impact of ambient working conditions on working productivity, comfort and satisfaction. Application of cognitive ergonomics including human machine interaction, manual control and the impact of automation on operator skills and attitude.

(0906706) COMPUTER INTEGRATED MANUFACTURING   (3 Credit Hours)

The course will cover topics that lead to design and implementation of Computer Integrated Manufacturing (CIM): Automated material handling systems, Robotics, Computer Numerical Control (CNC), Computer Aided Design and Computer Aided Manufacturing (CAD/CAM), Computer Aided Process Planning (CAPP), Group Technology (GT) and flexible manufacturing system (FMS). The course also includes a comprehensive project on the design and implementation of CIM systems.

(0906708) SYSTEMS SIMULATION   (3 Credit Hours)

Introduction to discrete systems simulation using computer modeling to optimize system design. The concepts of queuing theory, random number generators, transactions and facilities. Case studies and projects on diserete event system simulation.

(0906709) INFORMATION SYSTEMS ANALYSIS AND DESIGN   (3 Credit Hours)

Systems engineering methodology applied to the design of information systems for management of all types of organizations. Sata-base management systems. Distributed and centralized systems. Different management phases of system design and implementation.

(0906710) ENGINEERING ECONOMY   (3 Credit Hours)

The course covers advanced engineering economic topics, including development of depreciation strategies, corporate income tax structure and treatment, evaluation of single and multiple projects, reinvestment rate problem, capital budgeting. Also, probabilistic evaluation of single and multiple projects including certainty equivalent models.

(0906711) PROJECT MANAGEMENT AND NETWORK MODELS   (3 Credit Hours)

CPM and PERT. Project scheduling under limited resources condition. Project accounting, project management. Network models: maximum flow, minimum cost networks, minimum cost networks large networks, and their decomposition. Applications in wide range of fields, such as construction, large product development and manufacturing.

(0906712) ARTIFICIAL INTELLIGENCE   (3 Credit Hours)

Application of A.I. using different representations and research techniques including expert systems, Neural Networks, Genetic Algorithms, Fuzzy logic techniques. Case studies in operations research and manufacturing.

(0906713) METHODS ENGINEERING AND WORK MEANSUREMENT (3 Credit Hours)

Process Engineering Analysis and Design Techniques for Presenting processes, Process Performance Parameters, Process Cycle Analysis and Line Balancing. Methods for Improving Processes and Increasing Their Productivity. Incentive Plans and Human Factors.

(0906721) DESIGN AND ANALYSIS OF PRODUCTION SYSTEMS   (3 Credit Hours)

A course to integrate Industrial Engineering and Operations Research knowledge in Designing and Evaluating Manufacturing System. Topics include: Design of Facilities, Production lines, and Material Handling System. Selection of Equipment. Performance Measurement and evaluation.

(0906725) KNOWLEDGE MANAGEMENT   (3 Credit Hours)

Knowledge Definitions and Classifications, Methods for acquiring knowledge, knowledge principles, design, and usage in organizations, Computer aided knowledge systems, artificial intelligence and its application in knowledge management.

(0906726) SPECIAL TOPICS IN ENGINEERING MANAGEMENT (3 Credit Hours)

Selected topics of current interest in Engineering Management. The course is designed to give the students an opportunity to pursue special studies not offered in other courses.

(0906728) INDUSTRIAL HEALTH AND SAFETY ENGINEERING   (3 Credit Hours)
Concepts and Definitions. Industrial Hazards, Hazard Classification Schemes, Hazard Control, Hazard Analysis. Developing Hazard Control Programs.

(0906737)   PRODUCT DEVELOPMENT   (3 Credit hours)
Identifying a Product Development Opportunity using S-Curve and SWOT Analysis. Customer Needs Analysis using Quantitative and Qualitative Methods. Establishing Initial Product Specification Using Benchmarking and Function Analysis. Product Architecture Analysis. Product Concept Generation and Selection. Product Detail Design.

(0906798) COMPREHENSIVE EXAM

(0906799) MASTER THESIS   (9 Credit Hours)