MEM Curriculum Sequence and Course Descriptions

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**MBA 6830 - Operations Management**

*Three credit-hours. Prerequisite: None. One four hours session per week.*

This is a graduate course in manufacturing techniques. In this course the student will acquired deep knowledge of the tools, techniques and types of manufacturing processes and management of the production planning, schedule and operation. Topics such as Production and Inventory Control, just-in-time, total quality control, statistical process control, waste analysis, work measurement and world class Manufacturing will be discussed. Also cover manufacturing systems such as factory layout, machine center, robotics, sensing, manufacturing cells and automated factories will be included.

**MEM 5600 - Engineering Economic Analysis**

*Three credit-hours. Prerequisite: None. One four hours session per week.*

This is a graduate course in engineering analysis emphasizing the planning and control of engineering economics including manufacturing costs. In this course project cost evaluation including interest rates and continuous compounding, present-worth and capitalized cost, is discussed. Methodology to determine rate-of-return for various alternatives, benefit/cost ratio evaluation, replacement analysis and others are described. The preparation of cash-flow diagrams and introduction to cost estimation are studied. Determination of break-even values, sensitivity analysis and decision trees and introduction to value engineering techniques is included.

**MEM 6110 - Engineering Management I**

*Three credit-hours. Prerequisite: None. One four hours session per week.*
In depth discussion of the elements of modern management and business practices is conducted. This course is designed to provide students without specialized business training to understand the principles used by professionally trained managers to guide the typical industrial and business enterprise.

**MEM 6120 - Engineering Management II**

**Three credit-hours. Prerequisite: MEM 6110. One four hours session per week.**

This course enables students to deepen in the understanding of fundamental concepts and principles of general management emphasizing their application in technological and scientific organizations in industry and government. For the purpose of the study of management, one needs to perceive all major functions in some coherent framework. Such a framework is provided by breaking down the totality of the management process into its four major components: planning, organizing, leading and controlling. In this course, the student will explore the concepts that provide the foundations for these four managerial functions.

**MEM 6200 - Engineering Management Project**

**Three credit-hours. Prerequisite: MEM 6120. One four hours session per week.**

This is a project course that provides the opportunity to apply concepts and methods previously studied to the solution of problems in engineering management. Students will work individually, on problems proposed by the student and approved by the professor.

**MEM 6410 - Construction Management**

**Three credit-hours. Prerequisite: None. One four hours session per week.**

The management of construction is at one time an art and a science. Both have to deal with planning, scheduling, controlling, and following different activities of great diversity such as cost estimating, scheduling, contracting, insuring, accounting, labor relations, etc. At times the manager must use highly quantitative methods while at other times the intuitive or empirical approach is all what is available. Therefore construction and maintenance managers must be masters of a wide range of qualitative and quantitative subjects. Consequently he must possess a very high level of competency in a large number of areas.

This course is designed to help students gain a perspective regarding the construction industry and some cross-sectional understanding of the things to be mastered if they wish to be successful as construction managers.

**MEM 6610 - Productivity Management**

**Three credit-hours. Prerequisite: None. One four hours session per week.**

This course moves the engineer through the different approaches to Total Quality Management. Total Quality Management is a system to effectively achieve institutional goals with the active participation of all the employees, clients and suppliers. Through the course traditional management for productivity techniques, TQM, Crosby, Juran and Deming philosophies are discussed. The concepts of quality cycles, changes in institutional culture, zero defects, corrective action, productivity measurements, error cause removal, Pareto Principle, etc, are discussed.

**MGM 5500 - Managerial Accounting**

**Three credit-hours. Prerequisite: None. One four hours session per week.**

This is a graduate course where the accounting principles and techniques for making decisions are taught. The role of decision criteria based on General Accepted Accounting Principles and others are explained in detail. Therefore, this course provides the essential information that the manager or business man needs to have control of the firm in order to obtain his objectives effectively and efficiently.

**MGM 5700 - Probabilities and Statistical Methods**

**Three credit-hours. Prerequisite: None. One four hours session per week.**

This is a graduate course in relevant business statistics emphasizing applications specific to engineering disciplines. In this course various probability and statistical methods to sample, measure of dispersion and skewness, probability distributions are studied. Also testing hypothesis and making decisions, analysis of variance, chi-square analysis and linear regression and correlation are examined. Advanced topics such as nonlinear regression, multivariable analysis, time series analysis and exploratory data analysis are introduced.
Case studies of quality control and engineering decisions are assigned and discussed.

**MGM 6070 - Managing Human Resources**

Three credit-hours. Prerequisite: None. One four hours session per week.

Psychology concepts and corresponding methodology to manage human resources in a scientific and technical enterprises. Techniques for hiring, benefits, incentives, promotion, retention, development, replacement of personnel, and creativity, among others are discussed emphasizing the human dimension. Techniques to solve complaints, insubordination, and violations of regulations are introduced.

**MGM 6560 - Management of Information Systems**

Three credit-hours. Prerequisite: None. One four hours session per week.

Information systems that provide support for management in areas such as finance, manufacturing, cost estimation, and marketing. Introduction to analysis of data flow diagrams, databases, and data communication are introduced.

**MGM 6620 - Managerial Finances**

Three credit-hours. Prerequisite: MGM-5500. One four hours session per week.

Financial concepts encountered in engineering. Situations are introduced based on the fact that they are an integral part of planning, organizing, directing and controlling activities. The financial cycle budgeting, accounting, controlling and auditing is discussed.

**MGM 6690 - Decision Making Techniques**

Three credit-hours. Prerequisite: MGM 5700. One four hours session per week.

This is a graduate course where the scientific management methods for making decisions and solving administrative problems are taught. The role of decision criteria and subjective factors, Bayesian analysis, advanced decision making methods, linear programming and analysis of alternatives are discussed. Also the value of reliable and representative information, utilization of statistical information, strategic analysis and projections, forecasting.