Engineering Management Program

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Lecturers: Abillama, Walid; Charif, Hassan; Jawad, Dima; Nizam, Youssef; Nouelhid, Nazim; Tannir, Akram; Trabulsi, Samir
Instructor: Ajam, Maher

General Information

The graduate program leading to the degree of Master of Engineering Management (MEM) provides professional training in engineering management, with emphasis on technically based organizations and applications to various engineering and related disciplines. This program addresses the specific area of the management of technical activities and enterprises.

A student may select his/her courses in a way that satisfies one of the four following areas of concentration:

• Financial Engineering
• Industrial Management
• Projects and the Built Environment
• Information and Organizational Management

The requirements for the Master of Engineering Management degree can be fulfilled by pursuing one of the following two options:

Non-thesis Option: Under this option a student is required to complete a total of 33 credits, subdivided as follows:

• Four core courses (12 credits)
• Three electives from the student’s area of concentration (9 credits)
• Two area-related electives (6 credits)
• Two free electives (6 credits)
• Seminar (0 credit)

Note: The ENMG 797 Special Project course can be used to satisfy the 3-credit requirement of any elective depending on the nature of the topic addressed.

Thesis Option: Under this option, a student is required to complete a total of 30 credits, subdivided as follows:

• Four core courses (12 credits)
• Three electives from the student’s area of concentration (9 credits)
• One free elective (3 credits)
• Thesis (6 credits)
• Seminar (0 credit)

A flexible combination of courses not in fulfillment of either option stated above leads to no mention of any area of concentration on the student’s transcript.

Requirements

In order to be eligible for admission to the MEM program a student must have a bachelor’s degree in one of the engineering disciplines, in architecture, or in another related field, and must satisfy the requirements of the University and the Faculty of Engineering and Architecture for admission to graduate study, as specified in the relevant sections of this catalogue.

Graduates of universities other than AUB, or from majors other than engineering or architecture, may be required to take undergraduate prerequisite courses to make up for deficiencies.

A student is not allowed to register in the program for more than four calendar years beyond the date of his/her first registration, except with the approval of the Graduate Studies Committee of the faculty.

Graduate Courses

Core Courses

ENMG 601 Management Theory 3 cr.

ENMG 602 Introduction to Financial Engineering 3 cr.

ENMG 603 Probability and Decision Analysis 3 cr.
ENMG 604 Deterministic Optimization Models 3 cr.

Elective Courses

Operations and Financial Engineering Sequence

ENMG 611 Supply Chain Design and Management 3 cr.
Introduction to supply chain management and its key issues. Logistics, network configuration. Inventory management. Distribution strategies and strategic alliances. The value of information in supply chains. Information technology and decision support systems for supply chain management.

ENMG 612 Production-Inventory Planning and Control 3 cr.
Replenishment systems for individual items. Inventory management for special classes of items. Multiple item and multiple location inventories. Introduction to supply chain management and multiechelon inventories. Production planning and scheduling: aggregate production planning, MRP, JIT, OPT, and short-range production scheduling.

ENMG 613 Manufacturing Systems and Facilities Planning 3 cr.

ENMG 614 Human Factors Engineering 3 cr.

ENMG 615 Industrial Scheduling 3 cr.
Deterministic models for single machine, parallel machines, flow shops and flexible flow shops, job shops, open shops. Stochastic models for single machines, parallel machines, flow shops, job shops, open shops. Scheduling in practice: general purpose procedures, modeling scheduling problems, implementation of scheduling systems.

ENMG 616 Network Optimization: Algorithms and Applications 3 cr.

ENMG 617 Engineering Management Statistics 3 cr.

ENMG 621 Forecasting Methods and Applications 3 cr.

ENMG 622 Simulation 3 cr.

ENMG 623 Stochastic Models and Applications 3 cr.
Poisson process, renewal theory, queuing models, reliability theory. Markov chains, Brownian motion, random walks and Martingale, stochastic order relations.

ENMG 624 Financial Engineering I 3 cr.

ENMG 625 Financial Engineering II 3 cr.
Derivative securities: forwards, futures, and swaps; models of asset dynamics; options theory; interest rate derivatives. General cash flow streams: optimal portfolio growth, general investment evaluation. Prerequisite: ENMG 624.

Projects and the Built Environment Sequence

ENMG 631 Pre-Project Planning and Feasibility Analysis 3 cr.
ENMG 632 Engineering Project Management 3 cr.

ENMG 633 Advanced Topics in Project Management 3 cr.

ENMG 634 Design Management for Large Projects 3 cr.

ENMG 635 Project Deliverance and Contracts 3 cr.

ENMG 636 Dispute Resolution on Projects 3 cr.

ENMG 637 Logistics, Technologies, and Productivity Concepts 3 cr.

ENMG 638 Advanced Topics in Construction Management 3 cr.

ENMG 639 Infrastructure and Facility Management 3 cr.

ENMG 640 Sustainable Development Management 3 cr.

ENMG 641 Environmental Strategies for Development Projects 3 cr.
Introduction to global environmental problems including air, water, solid, pesticides, and toxic substances. The impact of such problems on forests, species, coasts, and wetlands. From cradle to grave as applied to all types of development projects including industrial, construction, agriculture, and others. Latest techniques and tools available to management such as industrial ecology, environmental impact assessment, etc.

Information and Organizational Management Sequence

ENMG 651 Decision Support Systems 3 cr.

ENMG 652 Custom Project Information System 3 cr.

ENMG 653 Knowledge Management 3 cr.
Knowledge management as a new management paradigm. Knowledge creation and capture. Knowledge codification and system implementation. Knowledge management system tools and portals. Ethical, legal, and managerial issues.

ENMG 654 Technology-Based Entrepreneurship 3 cr.
Introduces general theories, principles, concepts and practices of entrepreneurship and intrapreneurship. The entrepreneurial perspective, development the entrepreneurial plan, initiating entrepreneurial ventures, growth and development of entrepreneurial ventures, and contemporary challenges in entrepreneurship are discussed. The course includes case study analysis and group projects.
ENMG 655 Management of Technology 3 cr.
Management of technology at both the national and organizational level and its contribution to the
generation of national wealth. Engineering, science, and management principles contributing to the
development of a successful framework for managing technology within an organization, nationally or
internationally. Introduction to technological innovations. Planning and forecasting. Socio-
economic changes.

ENMG 656 Management of Technological Innovations 3 cr.
Strategic management of technology-based innovation within the firm. Assessing the innovative
capabilities of the firm. Managing the corporate R&D function. Managing the interfaces between
functional groups in the development process. Managing the new business development function in
the firm. Building distinctive technology-based competencies and competitive advantages.
Technological leadership versus followership in competitive strategy. Institutionalizing innovation.
Attracting and keeping corporate entrepreneurs.

ENMG 657 Contemporary Issues in Technological Development 3 cr.
Globalization revisited. Fast growth of information and communication technologies. The growing
importance of knowledge-based industries. Changing impact of international rules and regulations
concerned with quality standards, environmental constraints, trading generally, etc. Productivity
and competitiveness revisited. Framework factors, and changing conditions: national level, branch
level, and firm level. Privatization and participation of the private sector. Clustering and networking
of firms. Business development services and incubators. Technology and industry parks.

ENMG 658 Organizational Analysis and Design 3 cr.
Organization aspects such as form, centralization, formalization, differentiation, and culture. The
Contingent Organization Design concept: different organizational forms for different situations
(e.g., uncertainty, competition, size, strategy). Critiques from contemporary and classical
organization science literature. Understanding how an organization can work or fail, from the
purely descriptive process view to the purely reductionist view of the organization as an information
processing mechanism.

ENMG 659 Total Quality Management 3 cr.
Principles of total quality management. Leadership, customer satisfaction, employee involvement,
continuous process improvement, supplier management, and performance measures. Tools and
techniques including quality management systems (ISO), statistical quality control, quality function
deployment, benchmarking, etc.

ENMG 660 Business Process Re-engineering 3 cr.
Introduction to best practices in business process re-engineering. Diagnosis, design, and development
optimization. Management systems modeling. Performance improvement. Company culture and
corporate values reinforcement.

ENMG 661 Strategic Management 3 cr.
The organization as a whole and its interaction with its environment. The corporation as it
undergoes the process of a global transformation. Mergers, acquisitions, outsourcing, downsizing,
and privatization. Framework of analysis for the identification of central issues and problems usually
faced in strategic management. Understanding the effect of present and future environments on
the corporation’s welfare.

ENMG 662 Human Resources Management 3 cr.
Functional areas associated with effective human resources management. Human resource planning,
recruitment, and selection. Human resources development. Compensation and benefits. Safety and
health. Employee and labor relations. Human resource research. Emphasis on, and case studies
applied to, technical industries including manufacturing, engineering consulting, telecommunication,
construction, etc.

ENMG 698 Special Topics In Engineering Management 3 cr.

ENMG 700 Seminar
All students are required to register for the seminar during each fall semester.

ENMG 797 Special Project In Engineering Management 3 cr.
A supervised study that may involve special research work in the student's area of concentration.

ENMG 799 Thesis 6 cr