

# GESTION INGÉNIERIE - EN LIGNE (MEM)

## Les cours en gestion ingénierie (MEM) sont offerts par la Faculté de génie

### **MEM 5100 Introduction to Engineering Management (3 units)**

Introduction to management and engineering management. The structure of engineering organizations. The importance of accounting and finance, interpersonal skills, decision-making under conditions of uncertainty. The legal, ethical, technological and global context of management decision-making. Planning and control in engineering management.

**Course Component:** Lecture

### **MEM 5111 Creativity and Innovation (3 units)**

Factors which enhance individual and group creativity in organizations and its translation into successful technological innovations. The invention/innovation process. Creative problem-solving techniques. Entrepreneurship. Organizational climate for stimulating invention. Management of research and development. Project selection. Elements of financial decision-making. Organization design for innovation.

**Course Component:** Lecture

### **MEM 5119 Managing complexities in projects and programs (3 units)**

This course is focused on the management of the delivery mechanisms in complex projects and programs: the preparation, design and response to request for proposals, effecting benefits-based procurement, designing performance-based contracts, managing supply chain relationships, implementing the enabling enterprise-level systems and the delivery assurance culture required for success.

**Course Component:** Lecture

### **MEM 5120 Product Development and Management (3 units)**

Product development and management, including engineering aspects of the process. The latest trends and practices, insight into processes which facilitate product management and development, understanding of product management and development practices via case studies, development of the leadership and management skills required to create, initiate, develop, bring to market and implement new technological products and services.

**Course Component:** Lecture

### **MEM 5121 Taguchi Methods for Engineering R & D (3 units)**

The role of experiments in product innovation. Taguchi/Plackett-Burman methods for design of experiments. Analysis of means. Analysis of variance. Contrasts and multifactorial ANOVAs. Fractional factorial designs. A-priori and post hoc pooling, scree plots. Numerous application examples focused on engineering design.

**Course Component:** Lecture

### **MEM 5122 Operational Excellence and Lean Six Sigma (3 units)**

Lean Six Sigma Green Belt tools and techniques, operational efficiency, waste and variability reduction, continuous improvement, the pursuit of perfection. DMAIC (define, measure, analyze, improve and control), process mapping, data collection and analysis, root cause problem solving, the cost of quality, mistake proofing, change management.

**Course Component:** Lecture

### **MEM 5150 Topics in Engineering Management (3 units)**

Recent and advanced topics in the field of Engineering Management and its related areas. Topics vary from year to year.

**Course Component:** Lecture

### **MEM 5231 Principles of Management and Leadership for Engineers (3 units)**

The difference between management and leadership. Development of increased skills and understanding of participant preferences for the management of interpersonal and team-based issues and processes in a work environment. Special focus on diversity and ethics in a team environment. Effective business communications, including skills for delivery of high quality business presentations; exposure to common business software for inclusion in the student's professional toolbox.

**Course Component:** Lecture

### **MEM 5241 Principles of Accounting and Finance for Engineers (3 units)**

The difference between accounting and finance. The role of the accounting function internal to the organization. A broad view of managerial accounting, introducing various costing systems, cost behaviour patterns, cost structures, budgeting and variances. The use of accounting for the evaluation of product, managerial and divisional performance thus helping students to understand what accounting can do for decision makers and how accounting choices affect decisions. Emphasis on the strategic importance of aligning accounting systems with firm technologies and goals. Financial management and the financial environment. Risk and rates of return. Discounted cash flow analysis and profitability indicators of potential capital investments.

**Course Component:** Lecture

### **MEM 5265 Business Intelligence and Performance Management (3 units)**

Role of information in organizations. Overview of systems used to capture, transform and disseminate information to managers. Linkages between information and knowledge management. The process of knowledge creation and application within and among organizations. Business Intelligence (BI) as a concept. Business intelligence and performance management approaches at operational levels in the organization. Frameworks such as the Balanced Score Card and Quality Management will be covered. Review of major BI tools and methods. Identification of the right types of BI for different types of decision making environments.

**Course Component:** Lecture

### **MEM 5280 Principles of Operations Management (3 units)**

Introductory course providing a broad knowledge in the field of operations in a realistic, meaningful and practical manner while explaining the different value-creation resources to any organization and how they form a solid operations framework. Operations Management (OM) is a subject that includes accounting, industrial engineering, management, supply chain management, purchasing, logistics, process engineering, manufacturing, product and service quality, and customer relationship management.

**Course Component:** Lecture

### **MEM 5300 Data Mining for Business Analytics (3 units)**

This course focuses on the application of data mining techniques and predictive analytics to business problem-solving. It covers key algorithms and techniques for extracting meaningful insights from business data, including data preprocessing, decision trees, neural networks, k-nearest neighbors, clustering, and association rules. Students will gain hands-on experience with data mining tools and software, applying these techniques in managerial contexts such as customer relationship management, marketing, sales, credit scoring, and churn analysis.

**Course Component:** Lecture

### **MEM 6100 Initiation and Design of Complex Projects and Programs (3 units)**

This course outlines the unique characteristics of complex projects and programs. Students will learn about methodologies and techniques to characterize the complexity of projects and programs, advanced stakeholder engagement, strategic analysis for complex projects and programs, adaptive planning techniques and organizational governance models for benefits realization, and the leadership of teams.

**Course Component:** Lecture

### **MEM 6260 Project Management (3 units)**

Project management methods based on standards, including the Guide to Project Management Body of Knowledge (PMBOK) of the Project Management Institute (PMI); project success and stakeholders; project charter and project plan; managing a project throughout its life cycle (identification, design, planning, realization and close-out). Projects that have incomplete and/or unstable requirements such as IT projects or software development projects. Topics covered include: portfolio management; risk management; determining requirements and solutions; quality management; communication management; design methods (Quality Function Deployment, Value Analysis); iterative and adaptive project management; fast tracking and concurrent methods of project management.

**Course Component:** Lecture

### **MEM 6281 Supply Chain Management (3 units)**

Overview of supply chain management as a framework for analyzing operations management situations and as a basis for general management situations. Major elements of the supply chain. Leading edge thinking on supply chain strategy and practical tools and methods for its implementation.

**Course Component:** Lecture

### **MEM 6285 Risk Management and Delivery of Complex Projects and Programs (3 units)**

This course provides an in-depth exploration of risk management within the context of complex projects and programs. Candidates will learn advanced techniques for identifying, assessing, and prioritizing both qualitative and quantitative risks in complex project environments. The course also emphasizes the mathematical modeling of risk assessment, enabling students to apply quantitative methods to evaluate and mitigate risks effectively. Key topics include risk management planning, risk assessment, and the development of contingency plans, with a focus on integrating risk management into project delivery. Additionally, the course discusses governance frameworks and the role of risk management in ensuring successful project outcomes. Real-world case studies will be analyzed to illustrate the application of risk management principles across various stages of the project lifecycle, particularly in high-complexity environments. The course includes a final project where candidates will apply risk management techniques to a complex project or program, followed by a presentation.

**Course Component:** Lecture

### **MEM 6287 Advanced Data Analytics (3 units)**

Fundamentals of Big Data as well as big database management (NoSQL) with applications in engineering and management. Review of the supporting technologies. AI concepts for advanced analytics with applications in engineering and management.

**Course Component:** Lecture