ENGINEERING MANAGEMENT (EMG)

EMG 710. Systems Thinking for Engineering Operations. (3 h)
This course introduces systems thinking as a framework for understanding, modeling, and improving complex engineering operations. Students examine interdependencies in technical systems, such as advanced manufacturing networks, infrastructure, and healthcare operations. Emphasis is placed on engineering contexts, equipping students to optimize performance, sustainability, and resilience in technical environments by applying a range of tools (e.g., digital-twin modeling, IoT data streams, Lean Six Sigma, and risk analysis).

EMG 712. Innovation Strategy for AI & Emerging Technologies. (3 h)
This course prepares engineering managers to lead innovation by strategically evaluating and integrating emerging technologies (e.g., AI, IoT) into engineering practice. Students explore technology readiness levels, adoption models, and governance frameworks while weighing ethical, regulatory, and risk considerations. The focus is on how engineering managers create competitive advantage and drive transformation through emerging technologies.

EMG 714. Strategic Leadership & Ethics in Engineering. (3 h)
This course prepares engineering managers to lead high-performing technical teams while upholding the public trust. Students examine contemporary leadership models alongside frameworks for ethical decision-making, stakeholder analysis, and professional codes of conduct. Through real-world cases, ranging from autonomous-vehicle safety to cybersecurity breaches, students practice resolving "grey-zone" dilemmas, designing governance policies, and communicating values-based decisions that align technical operations with organizational strategy. Emphasis is placed on cultivating an inclusive, innovation-oriented culture that balances performance, accountability, and societal impact.

EMG 720. Engineering Analytics. (3 h)
This course equips engineering managers with the analytical tools and strategies needed to transform engineering and operational data into actionable insights that drive innovation, efficiency, and risk-aware decision-making. Students learn to source, interpret, and visualize data from engineering systems, production processes, and project environments, applying advanced analytics to optimize performance and predict outcomes. Emphasis is placed on integrating analytics into strategic engineering management, aligning technical feasibility, operational objectives, and stakeholder needs, while addressing data governance, quality, and ethical considerations.

EMG 750. Managing Product Innovation & Intellectual Property. (3 h)
This course explores how organizations manage the product-innovation pipeline from idea generation to commercialization and the intellectual property frameworks that protect and maximize product value in engineering environments. Students apply portfolio management, experiment-driven prototyping, and Agile/Lean practices to move concepts toward product-market fit. The course integrates product strategy with IP management while addressing ethical, legal, and sustainability considerations. Emphasis is placed on collaborating with cross-functional teams and aligning innovation efforts with engineering priorities and organizational performance metrics.

EMG 751. Medical Technology Innovation. (3 h)
This course explores how engineering managers lead innovation in the highly regulated medical technology sector, integrating product development, compliance, and commercialization strategies. Students examine U.S. and international regulatory requirements—including FDA, European, and other global approval pathways—and the role of quality systems in accelerating safe and effective innovation. Case studies and applied projects emphasize both medical devices and digital health technologies, equipping students to guide products through design, testing, and launch in alignment with ethical, legal, and sustainability standards.

EMG 799. Capstone in Engineering Management. (3 h)
The Capstone is the culminating experience of the MEM program, where students integrate knowledge from core and elective courses to solve a real-world or research-based engineering management challenge. Projects must apply systems thinking, innovation, risk analysis, and ethical leadership. Each project is evaluated by a panel of faculty and industry professionals and must incorporate legal and sustainability considerations where appropriate.