

# ENGINEERING MANAGEMENT (EMG)

## **EMG 502 Emerging Technologies**

4 Class Hours, 4 Quarter Credit Hours

This course will be presented through the lens of the past, present, and future of technology and innovation, exploring related issues and the potential impact of technologies on organizations and society. Topics will include the study of how new technologies have impacted businesses historically, how current technologies are implemented, and how emerging technologies may impact industries and consumers. The course will examine the strategic implications associated with emerging, disruptive, and sustaining technologies.

## **EMG 511 Human Centered Design Thinking**

4 Class Hours, 4 Quarter Credit Hours

This course is the foundation of what the program defines as the practice and methods of design. Utilizing "Design Think" methodology, students will execute a variety of interdisciplinary projects and iterate the methods of observation, ideation, prototyping, and user feedback. Successful students will be able to convert needs into desirable solutions that will facilitate more creative and innovative people and organizations.

## **EMG 512 Systems Engineering**

4 Class Hours, 4 Quarter Credit Hours

Systems Engineering is an interdisciplinary approach and means to enable the realization of successful systems. It focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem including operations, performance, test, manufacturing, cost, and schedule. Emphasis includes the links of systems engineering to fundamentals of decision theory, statistics, lean Six Sigma and optimization. It also introduces the most current, commercially successful techniques for systems engineering.

## **EMG 522 Quantitative Business Analysis**

4 Class Hours, 4 Quarter Credit Hours

This course introduces a structured approach to problem solving and the fundamental quantitative methods used to formulate and solve problems to support business decision-making. Students will practice both analyses of complex situations and communication of results based on these decision models.

## **EMG 544 Decision Models**

4 Class Hours, 4 Quarter Credit Hours

Successful management requires the ability to recognize a decision situation, understand its essential features, and make a choice. However, many of these situations – particularly those involving uncertainty and/or complex interactions – may be too difficult to grasp intuitively, and the stakes may be too high to learn by experience. This course introduces spreadsheet modeling, simulation, decision analysis and optimization to represent and analyze such complex problems. The skills learned in this course are applicable in almost all aspects of business.

## **EMG 556 Master's Capstone**

5 Class Hours, 5 Quarter Credit Hours

Students must choose one of the following two options: Option 1: The master's project option requires engineering management students to demonstrate their competence in the skills and knowledge associated with their degree program. It is designed to show the in-depth learning and higher-order thinking of the students. With this option, students must choose a project in the field of engineering management. Then they will plan, organize, implement, and work towards the completion of the project in a controlled manner, so as to meet the goals and objectives of their project. The capstone project is usually carried out by an individual student and may be derived from the student's workplace where the student can exploit the workplace experience to benefit both the student and the student's employer. Before beginning work, each capstone project must first be approved by the MSEM Master's Project Committee. At the end of the project, the student will prepare a Final Project Report and defend this work product before the Program Director and members of the Committee. Option 2: The master's thesis option requires the engineering management students to carry out an investigation of technology or methodology in which the student has a strong interest. The topic of this investigation or research should be an extension or continuation of the topics covered in the MSEM curriculum. Before beginning this work, the topic must be approved by the MSEM Master's Project Committee. The student will submit a final report on the research and present the research before the Program Director and members of the Committee.