The M.S. in Industrial Engineering program provides an opportunity for you to pursue in-depth training in sustainability, quality engineering, optimization and supply chain management, or a customized plan to meet your professional and academic goals.

The M.S.I.E. program consists of four (4) core courses, three (3) courses in a concentration area, and free electives.

**Core courses:**

Each student is expected to have core knowledge in key areas of Systems Engineering. All students are required to complete the following four core courses:

- IE 5352 Design of Experiments
- IE 5357 Advanced Computer Simulations
- SE5341 Systems Engineering Fundamentals & Architectures (3-0)
- SE5342 Program and Systems Engineering Management (3-0)

**Specialization Tracks / Prescribed Electives:**

Major concentration areas include: Sustainability Engineering, Quality Engineering, Optimization and Supply Chain Management, and a Customized track approved by the College of Engineering (COE).

- Sustainability Engineering
- Quality Engineering
- Optimization and Supply Chain Management Engineering
- Customized

**M.S.I.E. - SUSTAINABILITY**

The engineering of sustainable systems involves the process of designing or operating systems such that they use energy and resources sustainably, i.e., at a rate that does not compromise the natural environment, or the ability of future generations to meet their own needs. Areas that can benefit from sustainability engineering include: water supply, food production, housing and shelter, sanitation and waste management, energy development, transportation, industrial processing, development of natural resources, cleaning up polluted waste sites, siting and planning projects to reduce environmental and social impacts, restoring natural environments such as forests, lakes, streams, and wetlands, improving industrial processes to eliminate waste and reduce consumption, and recommending the appropriate and innovative use of technology.
M.S.I.E. - QUALITY ENGINEERING

Because of the need for a totally systematic approach to quality, Quality Engineering has been identified as a body of knowledge with functional specialization in industry. The Quality Engineering concentration is thus intended to provide the student a foundation for applying the elements of the modern approach to quality, including industrial statistical applications, quality and reliability engineering, and management aspects. The subject matter of these various areas will be brought together to allow for effective integration of appropriate techniques. The fundamental concepts as well as the theory, methodology, technology, and procedures at the leading edge of the discipline will be covered.

M.S.I.E. – OPTIMIZATION & SUPPLY CHAIN MANAGEMENT

Engineering Optimization is the subject which uses optimization techniques to achieve design goals in engineering, including choosing the best option from a set of alternatives, or the best input settings for a process. Supply chain management (SCM) is the management of the flow of goods. It includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption. Interconnected or interlinked networks, channels and node businesses are involved in the provision of products and services required by end customers in a supply chain. SCM draws heavily from the areas of operations management, logistics, procurement, and information technology, and strives for an integrated approach.

M.S.I.E. - CUSTOMIZED

Some students have particular career goals for Master’s level specialization that are not covered by the above concentrations. For these students there is the non-designated M.S.I.E. The student can choose to concentrate in technical management, operations research, etc. The student will work closely with the graduate advisor and the chair of his or her committee to layout a plan of the courses that will allow the student to specialize in the chosen area of concentration. This option can be particularly attractive to students whose undergraduate degree is in Engineering, Computer Science, Mathematics, or Science.
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