

Weekend Format – Planned Systems Engineering Degree Plan

Cost Per Course: \$4,170 (tuition and fees)

Credit Hours: 3 hours per course

Course Delivery Method: Classroom

Pace: Two courses each semester. No summer courses.

EMIS	7300	Systems Analysis Methods Introduction to modeling & analysis concepts, methods and techniques used in systems engineering, design of products and associated production & logistics systems and analysis of operational system performance. Specific Topics include: probabilistic & statistical methods, Monte Carlo Simulation, optimization techniques, applications of utility & game theory and decision analysis. Prerequisites None
EMIS	7301	Systems Engineering Process The discipline, theory, economics, and methodology of systems engineering is examined. The historical evolution of the practice of systems engineering is reviewed, as are the principles that underpin modern systems methods. The economic benefits of investment in systems engineering and the risks of failure to adhere to sound principles are emphasized. An overview perspective distinct from the traditional design- and analytical-specific disciplines is developed. Prerequisites None
EMIS	7303	Integrated Risk Management An introduction to risk management based upon integrated trade studies of program performance, cost, and schedule requirements. Topics include risk planning, risk identification and assessment, risk handling and abatement, risk impact analysis, management of risk handling and abatement, and subcontractor risk management. Integrated risk management methods procedures, and tools will be examined.

Prerequisites

None

EMIS 7305

Systems Reliability, Supportability and Availability Analysis

This course is an introduction to systems reliability, maintainability, supportability and availability (RMS/A) modeling and analysis with an application to systems requirements definition and systems design and development. Both deterministic and stochastic models are covered. Emphasis is placed on RMS/A analyses to establish a baseline for systems performance and to provide a quantitative basis for systems trade-offs.

Prerequisites

EMIS 7300 and 7301, or equivalent

EMIS 7307

Systems Integration and Test

The process of successively synthesizing and validating larger and larger segments of a partitioned system within a controlled and instrumented framework is examined. System integration and test is the structured process of building a complete system from its individual elements and is the final step in the development of a fully functional system. The significance of structuring and controlling integration and test activities is stressed. Formal methodologies for describing and measuring test coverage, as well as sufficiency and logical closure for test completeness, are presented. Interactions with system modeling techniques and risk management techniques are discussed. The subject material is based upon principles of specific engineering disciplines and best practices, which form a comprehensive basis for organizing, analyzing, and conducting integration and test activities.

Prerequisites

Graduate student status

EMIS 7310

Systems Engineering Design

This course is an introduction to system design of complex hardware and software systems. Specific topics include design concept, design characterization, design elements, reviews, verification and validation, threads and incremental design, unknowns, performance, management of design, design metrics, and teams. The class will center on the development of real-world examples.

Prerequisites

None

EMIS 7312

Software Systems Engineering

The course focuses on the engineering of complex systems that have a strong software component. For such systems, software often assumes functions previously allocated to mechanical and electrical subsystems, changing the way systems engineers must think about classical systems issues. The course provides a framework for addressing systems engineering issues by focusing on the Software Engineering Institute's Systems Engineering Capability Maturity Model (SE-CMM). Topics include deriving and allocating requirements, system and software architectures, integration, interface management, configuration management, quality, verification and validation, reliability, and risk.

Prerequisites

None

EMIS 7320

Systems Engineering Leadership

This course augments the management principles embedded in the systems engineering process with process design and leadership principles and practices. Emphasis is placed on leadership principles by introducing the underlying behavioral science components, theories and models. The course demonstrates how the elements of systems engineering, project management, process design, and leadership integrate into an effective leadership system.

Prerequisites

EMIS 7301

EMIS

7340

Logistics Systems Engineering

An introduction to concepts, methods and techniques for engineering and development of logistics systems associated with product production/manufacturing, product order and service fulfillment, and product/service/customer support, utilizing system engineering principles and analyses. Specific topics include: logistics systems requirements, logistics systems design & engineering concurrently with product and service development, transportation & distribution, supply/material support, supply web design & management and product/service/customer support.

Prerequisites

Math 2339 or equivalent