

# SYE - SYSTEMS ENGINEERING

## **SYE 5470 Creative Problem Solving in Design and Manufacturing Cr. 3**

Concepts of laws of natural development of engineering systems. Algorithm for inventive (creative) problem-solving (AIPS-85). Creative use of physical and geometrical effects in design of mechanical and manufacturing systems. Concepts of strength, stiffness, vibratory effects, reliability in mechanical design. Offered Yearly.

**Equivalent:** IE 5490, ME 5470

## **SYE 6490 Introduction to Systems Engineering in Design Cr. 3**

Provides an introduction to the engineering and analysis of human-made systems with an emphasis on the process of bringing systems into being. Includes an introduction to systems sciences and engineering and will follow the engineering process from conceptual systems design through concept selection, concept validation, life-cycle acquisition, life-cycle costing, software development, system architecture, and risk management. Addresses system engineering program evaluation including: evaluation requirements, evaluation of the system engineering organization, and program reporting, feedback, and control. Offered Fall.

**Restriction(s):** Enrollment limited to students in the College of Engineering.

## **SYE 6491 Systems Engineering Thinking and Concepting Cr. 3**

This course aims to provide students with an understanding of the engineering approach of systems thinking and concepting. This is the art of looking at connected wholes rather than separate parts of a problem. Knowledge and skills will be developed to use in performing a deep analysis of a problem or opportunity situations where system responses are required. The course will provide an understanding of the essential properties of a systems thinker and the complete aspects of a problem in defining the needs and required functionality, documenting them, designing, and validating the product/system solution accordingly for a successful launch. Offered Yearly.

## **SYE 6492 Adaptive Acquisition Cr. 3**

This course aims to provide students with an understanding of the adaptive acquisition process of complex system development. This includes the pathways and transitions to pathways to deliver a product or system and future updates. Students learn how Systems Engineering programs may tailor, combine, and transition between acquisition pathways to deliver system capabilities (including complexity, risk, and urgency) to satisfy user requirements. Offered Yearly.

**Prerequisite:** SYE 6491 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in the College of Engineering.

## **SYE 7491 Systems Engineering Processes – Early to Mid-Design Cr. 3**

This course aims to provide students with an understanding of the Systems Engineering approach to the engineering and analysis of human-made systems. This course provides students with an emphasis on the process of bringing systems into being from product/system inception into preliminary design. The course provides the systems engineering process operating over primary system life-cycle functions that will be addressed and broken down in detail. The course will then assess a student's proper practical use of the processes and tools. Offered Yearly.

**Prerequisite:** SYE 6491 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in the College of Engineering.

## **SYE 7492 Systems Engineering Processes – Late to Post-Design Cr. 3**

This course aims to provide students with an understanding of the Systems Engineering approach to the engineering and analysis of human-made systems. This course provides students with an emphasis on the process of bringing systems into being from product/system preliminary design to post design. The course provides the systems engineering process operating over primary system life-cycle functions that will be addressed and broken down in detail. The course will then assess a student's proper practical use of the processes and tools. Offered Yearly.

**Prerequisite:** SYE 6491 with a minimum grade of C and SYE 6492 with a minimum grade of C and SYE 7491 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in the College of Engineering.

## **SYE 7495 Systems Engineering Capstone Cr. 3**

This course aims to provide students with a detailed review of Systems Engineering major processes, management, and lifecycle processes. Students will conduct an individual capstone project to create a systems engineering and management plan for a major product/system design and development effort for a commercial or defense program. Offered Yearly.

**Prerequisite:** SYE 6491 with a minimum grade of C and SYE 6492 with a minimum grade of C and SYE 7491 with a minimum grade of C and SYE 7492 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in the College of Engineering.