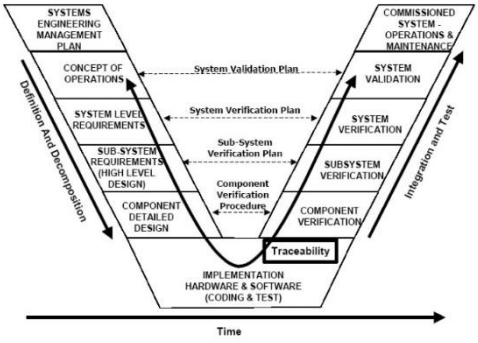
UCONN
SCHOOL OF ENGINEERING

United Technologies Corporation
Institute for Advanced Systems Engineering
UNIVERSITY OF CONNECTICUT

Graduate Courses in Systems Engineering

SE 5000 Introduction to Systems Engineering

What's Exciting About this Course? Learning the foundations of systems engineering and gaining an in-depth knowledge of system engineering principles, processes, and methods. Reading about how others apply and excel at Systems Engineering through examples and case studies. Discussing and sharing best practices and challenges with classmates and instructor for building effective systems engineering functions and processes. Applying systems thinking concepts to structured challenges.



Course Description. An introduction to the hard and soft skills that are required of good systems engineers. Lectures follow the competency models for systems engineers and include topics such as systems thinking, needs identification, requirements formulation, architecture definition, technical management, design integration, as well as verification and validation of designs. Some of the key systems engineering (SE) standards will be covered and the roles of organizations in enabling engineers to develop systems will be explored. Applications of SE concepts and tools in various settings will be discussed through examples and case studies. Students will learn to apply the SE methodologies in modern complex system development environments such as aerospace and defense, transportation, energy, communications, and modern software-intensive systems.

Course Outcomes

- Describe processes, methods, and practices of systems engineering.
- Apply systems engineering practices and methods to relevant examples.
- Develop requirements, architectures, specifications, verifications, and tests.
- Analyze systems using systems engineering approaches to increase performance.
- Recognize important systems engineering and systems thinking strategies and practices in examples and cases.

Topics: INCOSE SE Vision 2025, Systems Engineering Overview, Life Cycle Stages, Decision Making and Risk Assessment in Design, Model-Based System Engineering, Business and Mission Analysis Process, Stakeholder Needs and Requirements Definition Process, Architecture Definition Process, Interface Design and Definition, System Definition Process, Design Definition Process, System Analysis Process and Implementation Process, Integration, Verification, Transition, and Validation Processes, Operation, Maintenance, Disposal Process, Tailoring SE Processes, Systems Thinking.

Course Objectives and Links to Overall Program Goals

Engineers obtain a strong foundational knowledge of systems engineering principles and practices, which can be leveraged and applied in later courses when analyzing and designing cyberphysical systems. Engineers see the "big picture" of systems engineering from an organizational and process viewpoint.