COURSE PLAN

Week 1: Systems engineering – what is, origin, and examples; Systems engg as a profession Power of systems engg and examples; Systems engg viewpoint, perspectives, domains; Systems engg /f_ields, approaches, activities, and products

Week 2: Complex system structure-building blocks, hierarchy, interfaces; Complex system structure-environment, interactions, complexity; System development process–life cycle, evolutionary characteristics; Systems engg method; Systems testing throughout development

Week 3: Managing systems development, risks, work breakdown structure (WBS), systems engg management plan (SEMP) Systems risk management, organizing for systems engg; Need analysis – originating, operations, functional, and feasibility Need validation, systems ops requirement; System requirements development, performance requirements

Week 4: Implementing concept exploration, validating requirements; Concept definition – selection and validation, functional analysis and allocation; Systems architecture, system modeling languages, Model-Based Systems Engg (MBSE) Decision making, modeling for decisions; Simulation, Trade-off analysis

Week 5: Engg development stage – program risk reduction, prototype development for risk mitigation Development testing, risk reduction; Revision of functional analysis and design; Overview of probability data analysis; Hypothesis testing

Week 6: Engineering design – implementing system building blocks, component design; Design validation, change management; Concepts of reliability, redundancy; Concepts of maintainability, availability, producibility; User interface design and GUI

Week 7: Integration, testing and evaluating total system; Test planning and preparation, system integration Developmental and operational test and evaluation; Engineering for production, transition from development to production Production operations - 1

Week 8: Production operations - 2; Installation, maintenance and upgrading; Installation testing; In-service support Upgrades and modernization