
Systems Engineering and Management

Course No. 420

Course Outline No. 420

FOR WHOM INTENDED This course is designed to assist program and project managers, engineering managers, and development project engineers to understand the systems engineering process—its structure and methodology, decision making techniques, and the systems engineering disciplines involved in the planning design, and development of large scale engineering systems.

LEARNING OBJECTIVES Completion of this course gives participants practical and basic knowledge of management concepts and skills prerequisite to effectively participating either directly as members of the Program/Project Management Office (PMO) staff or in a support role to the PMO staff. Emphasis can be placed on 1) Avionics systems engineering, 2) DoD weapons systems engineering and/or 3) Management Information Systems (MIS) projects such as hardware and software upgrades, new hardware and software acquisitions and development.

BRIEF DESCRIPTION OF COURSE This course covers Reliability aspects of Systems Engineering: reliability, maintainability, and safety design considerations; integrated logic support considerations; test and evaluation; cost as a design parameters; and workshops and case studies.

Because of the highly interactive format, a semester long course can be presented and should be understood in this time frame. The instructor welcomes questions and comments during lectures. Private discussions can be arranged between instructor and participants after class. There will be a final exam to evaluate the students' understanding of the course material presented.

CERTIFICATE PROGRAMS: This course may be used as an elective for any TTI specialist certificate program.

PREREQUISITES: There are no specific prerequisites. This course is aimed toward individuals actively involved in related technical fields. This course is designed to serve the varied needs of technicians and engineers. The Instructor maintains a good balance between practical training and theory, wherever possible.

TEXT Each participant will receive a course workbook, which contains most of the viewgraphs used during the presentation.

COURSE HOURS, CERTIFICATE AND CEUs Open courses meet seven hours per day. Upcoming presentation dates can be found on our current [open course schedule](#). Class hours/ days for on-site courses can vary from 14–35 hours over 2–5 days as requested by our clients. Upon successful course completion, each participant receives a certificate of completion and one Continuing Education Unit (CEU) for every ten class hours.

For [schedules](#), [general information](#) and a [registration form](#), see TTI's web site.

Introduction

Reliability: Introduction

Application • Purpose
History of reliability • Importance of reliability
Reliability elements
Requirements • Specifications • Reliability Plan
Reliability design • Reliability Test • Environmental Qualification
Reliability Specifications and Standards
Reliability Test and Evaluation • Test Design • Test Instrumentation
Test Facilities
Reliability Analysis: Probability
Distributions • Practical application
Failure Analysis • Reliability Data Bases
The Acquisition Process and Associated Reliability Effort
Quality and Reliability
Accelerated Reliability Testing
Class Problem—Develop a Reliability Program Plan

Maintainability

The Naval Aviation Maintenance Program
Missiles
Targets
Avionics
Specification
Assessment
Class problem—Plan a maintainability demonstration

Safety Design

General safety considerations
Flight safety • Ordnance safety • Industrial safety
Risk assessment
Class Problem—Develop a risk assessment—a missile launch

Integrated Logistics Support

ILS elements
ILS considerations
Weapons
Electronic warfare
Targets
Class problem—Develop an ILS plan

Test And Evaluation

DOD Policy and Navy Implementation
Developmental T&E—Operational T&E—Production T&E
Purpose • Participants and roles
Considerations • Case histories
Class problem—Develop a TEMP (Test and Evaluation Master Plan)

Design To Cost

Concept
Application
Emphasis in Army—several examples
Navy example—The 75K missile.

Summary, Final Quiz

Award of Certificates for Successful Completion



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