Principles of Project/Systems Engineering

Course No. 421

FOR WHOM INTENDED This course is designed for all levels of engineers and managers working on/with technology and technical related projects/programs; military and civilian engineers of all disciplines, project engineers, program managers, and scientists.

BRIEF COURSE DESCRIPTION This course provides an introduction to project engineering principles, processes and practices. Quality assurance/ control and system engineering techniques and their application to project engineering will be covered.

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 review to evaluate the students' understanding of the course material presented.

DIPLOMA PROGRAMS: This course may be used as an optional course for any TTI specialist diploma 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 managers and engineers. The instructor maintains a good balance between practical training and theory, wherever possible.

TEXT Each student will receive 180 days access to the on-line electronic course workbook. Renewals and printed textbooks are available for an additional fee.

COURSE HOURS, CERTIFICATE AND CEUs
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.

Course Outline No. 421

Introduction and Fundamentals: Definitions • Systems Engineering Role, Process • Team Organization • Requirements: Definition, Analysis, Tracking • Interface Management • Resources • Functional Analysis • Design Synthesis and Trade Studies • Modeling and Simulation • Work Breakdown Structure (WBS) • Configuration Management and Review Process • Risk Management and Analysis • Product Life Cycle • Life Cycle Integration • Group Project #1

Requirements Definition and Tracking: Attributes of Good Requirements • Traceability • Requirements Documentation and Databases • Requirements Tree • Requirements Allocation, Margins, Budgets • Requirements Analysis Strategies and Outputs • Representative Requirements Analysis Procedure (IEEE P1220) • Follow-on Tasks • Requirements Tracking

Interface Management: What is an Interface? • Analysis and Identification • N-Squared Diagram Method • Schematic Diagram Method Interface Dictionaries • Global Documents • Responsibility

Resource Allocations and Tracking: Allocations and Margins

Functional Analysis: Process • Primary Steps • Flowchart • Functions Hierarchy Diagram (FHD) • Functional Flow Block Diagram (FFBD) • Timeline Analysis Sheets (TLS) • Requirement Allocations Sheets • Functional Architecture

Design Synthesis: Design Tools • Concept Description Diagram

Trade Studies: Introduction • Process

Modeling & Simulation: Classes • Constructive Models and Simulations • Model Verification and Validation • Incorporation into Design Process • Group Project #3

Work Breakdown Structure (WBS): Uses • Generating a WBS • Element Dictionary • Utilizing a WBS

Configuration Management: Baseline • Planning • Identification/ Documentation • Configuration Control and Change Process • Accounting • Audits • Interface Management and Documentation

Review Process: Technical Reviews: Responsibilities, Phasing • Standard Reviews • Requirement Reviews • Design Reviews • Critical Design Review (CDR) • Verification Reviews

Risk Management: Categories of Risk • Risk Planning, Identification and Assessment • Risk Matrix • Risk Scoring Risk Mitigation and Monitoring • Group Project #4

Requirements Verification: Verification Classes: Qualification, Acceptance, System Test and Evaluation • Methods of Verification: Analysis, Inspection, Demonstration, Test • Task Flow Verification vs. Noncompliance • Group Project #5

Integrating System Engineering in Project Planning

System Engineering Execution: Basics • Core Responsibilities • Fundamental Activities • System Engineering Effort • Teamwork: Basics, The IPT • Establishment and Consistency • Conclusion

Summary, Final Review, Award of Certificates

Technology Training, Inc.
(a tti group company)
Toll-free telephone:
866-884-4338 (866-TTi-4edu)
805-845-5050 (International)
E-mail: Training@ttiedu.com
www.ttiedu.com