

# Requirements Engineering 5-Day Course

*Transforming stakeholder input into clear, accurate, verifiable requirements*

## Why Requirements Engineering?

Developing the wrong thing is a bigger problem in development than making mistakes developing the right thing. This course addresses the single biggest cause of project failure: poor requirements. Learn to **capture, validate, and specify requirements** that are **sufficiently complete, correct, and verifiable**, enabling teams to deliver systems and products that truly meet stakeholder needs.

## What You Will Learn

This course comprises two complementary modules: **Requirements Analysis** and **Specification Writing**. Together, you will learn practical, efficient techniques to identify and fix defective requirements, and produce high-quality requirements specifications.

*You will learn to:*

- **Capture and validate requirements** by analysis of stakeholder needs
- **Transform validated requirements** into clear, well-structured requirements specifications
- **Apply modeling-supported methods** of proven effectiveness across diverse industries and technologies.

## Who Should Attend and Why

This course is for professionals who define, capture, validate or specify requirements and want to make a substantial difference to project success via better requirements. You will learn to **uncover unrecognized needs, eliminate costly misunderstandings** and **achieve requirements sets that inspire confidence** as a sound basis for acquisition or development.

*Ideal for:*

- Anybody who receives requirements and needs to act on them, including systems and software engineers
- Business analysts, engineering and project managers
- Technical leads, product definition staff, and procurement or contracting professionals seeking worthwhile improvement in project outcomes through better requirements
- Test personnel (who are often victims of bad requirements).

### Earn CE/CPD Credit

*This course is recognized for professional development purposes:*



**INCOSE CSEP  
Renewal**

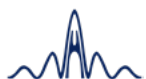
- 40 Continuing Education PDUs



**PMI Talent Triangle®  
Suggested PDUs**

- Ways of Working – 37
- Power Skills – 1
- Business Acumen – 2

**20,000 Professionals Trained Across 43 Countries**



# Interactive, Results-Focused Learning

Delivered through expert instruction, group discussion and hands-on workshops that form the core of the training, this course builds understanding through practice.

*Participants receive:*

- Comprehensive training manual, and a workbook for each module
- Model solutions, guides, checklists and templates for immediate use
- Complimentary access to PPI's **Systems Engineering Goldmine** and **Systems Engineering Tools Database**.

Available **in-person** and **online** for both **open-registration** and **corporate** groups.

## Presenters

PPI's presenters are **internationally recognized** systems and requirements engineering practitioners and consultants who bring **decades of real-world experience**, ensuring every concept taught is value-adding, practical, relevant and immediately implementable.

## PPI Training Reviews



*"The training made me better at parsing and writing strong requirements."*

**Course participant,**  
USA



*"The course demonstrated how poor requirements lead to waste and how being methodical avoids conflict."*

**Course participant,**  
Australia



*"Learned a great deal about good versus bad requirement analysis and requirement specification writing."*

**Course participant,**  
USA

## Trusted Worldwide

PPI delivers **outstanding training and consulting** to many **hundreds of enterprises worldwide**, from Fortune 100 companies (presently 19% of them) to small start-ups. PPI is a truly international company, with personnel based in eight countries, and clients across six continents benefiting from our work.

**NEC**

**SIEMENS**

**BAE SYSTEMS**

**AIRBUS**

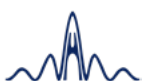
**THALES**



**TNO**

**babcock™**

**BHP**



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# Requirements Engineering 5-Day Course Outline

## 1. Why Emphasize Requirements?

- issues and terminology
- lessons from real projects

## 2. Requirements within the System Life Cycle

- the origin of requirements
- concept of the system boundary
- the modeling boundary
- the systems engineering process
- development of system architecture and detail design, related to requirements
- requirements traceability
- summary of terms relating to requirements
- baselines and their use
- the waterfall life cycle paradigm
- incremental acquisition/development
- evolutionary acquisition/development
- **workshop – principles of requirements engineering**
- common requirements pitfalls in the system life cycle

## 3. Types of Requirements

- definitions and views
- relationship to design
- relationship to baselines
- why categorize requirements by type?
- eight basic types
- differences between requirements for physical systems/hardware, software, services
- non-requirements
- **workshop – types of requirements**
- other categories – architectural design drivers, critical, global, priority, importance, stability

## 4. The Quality of Requirements

- correctness
- completeness
- consistency
- clarity
- non-ambiguity
- traceability
- testability
- singularity
- feasibility
- balance
- freedom from product/process mix

## 5. Requirements Analysis Methodology

- contexts within which requirements analysis is performed
- stakeholder identification
- initial assessment by document (if any) review, and planning
- measuring requirements quality
- context flow analysis
- context analysis
- **workshop – context analysis**

- design requirements analysis
- **interactive exercise – design requirements analysis**
- states & modes analysis
- **workshop – states and modes analysis**
- requirements parsing analysis
- **workshop – parsing analysis**
- functional analysis – needs analysis, operational analysis, use cases
- **workshop – functional analysis in requirements analysis**
- rest of scenario analysis
- **optional workshop – rest of scenario analysis**
- out-of-range analysis
- **optional workshop – out-of-range analysis**
- Entity-Relationship-Attribute (ERA) analysis
- other constraints search
- stakeholder value analysis
- methods of engaging in requirements dialog
- verification requirements development
- operational concept description
- clean-up – keyword-based searching for residual requirements defects
- special issues of the human interface
- supplementary methods and notations
- common pitfalls in requirements analysis

## 6. Coping with the Real World

- what to do when the user “doesn’t know”
- how to respond to “moving goalposts”
- protecting yourself from the communication chasm

## 7. Tool Support to Requirements Analysis

- tools supporting requirements analysis
- tools supporting requirements management
- examples of available tools
- common pitfalls in using tools

## 8. Verification of Requirements Analysis Work Products

- requirements reviews
- keyword search techniques
- use of metrics

## 9. Management of Requirements Analysis

- management issues
- using and managing “TBDs”
- designing a requirements codification scheme
- managing resolution of requirements issues
- defining reviews and reports

## 10. Preparing for Transformation of Requirements into Requirements Specifications

- what is a requirements specification?
- how requirements specifications relate to requirements
- how requirements specifications relate to configuration baselines

# Requirements Engineering 5-Day Course Outline (Continued)

- preparing for the transition from requirements to requirements specification
- using a requirements database to automate requirements specification production

## 11. Requirements Flowdown into System Element Requirements Specifications

- the specification tree
- special considerations for interface requirements

## 12. Requirements Specification Types

- types of requirements specification
- Institution of Electrical and Electronic Engineers (IEEE) specification standards
- United States (US) Military and other international specification standards
- score sheet for public domain specification standards

## 13. Structuring your Requirements Specification

- what to put in your system requirements specification, the statement of work (or equivalent) and the conditions of contract
- **workshop – allocating requirements to solicitation documents**
- structuring a statement of work
- structuring a system requirements specification
- dealing with variants
- **workshop – writing a scope section to deal with variants**
- states and modes
- **workshop – structuring a specification to deal with states, modes and functions**
- functional versus design oriented specifications
  - differences
  - when to use each type
- function and performance
- **workshop – classifying specified requirements as functional or design**
- **workshop – writing a functionally-oriented requirements**

### **specification**

- **workshop – writing a design-oriented requirements specification**
- other requirements types
- annexes, appendices and applicable documents

## 14. Requirements Specification Writing

- review of requirements quality
- requirement structural template
- **workshop – writing requirements using the parsing template**
- requirements constructs
  - shall, should, will, and may
  - linking
  - cross-referencing
  - **workshop – using precedence**
  - defining terms
  - **workshop – defining terms**
  - context dependence
  - reference to applicable documents
- use of precedence
- **workshop – linking and cross-referencing**
- using success criteria to express otherwise vague requirements
- **workshop – using success criteria**
- **workshop – a requirement specification in a sentence**
- paragraph headings
- use of supporting data
  - mission profiles/use cases
  - baseline designs
  - benchmarks
- linking the specification to the statement of work or conditions of contract
- verification specifications
- **optional workshop – evaluation of example specifications**

## 15. In Closing

- additional reference material



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systems/product engineering training & consulting  
for project success ...

