

5-DAY COURSE

Requirements Engineering



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

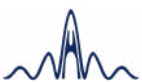
- 40 Continuing Education PDUs



PMI Talent Triangle®
Suggested PDUs

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

20,000+ Professionals Trained Across 43 Countries



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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

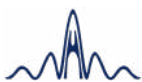
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Requirements Engineering 5-Day Course Outline

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
- Example applications of AI to requirements analysis
- 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**
- Example applications of AI to requirements specification of subsystems

15. In Closing

- Additional reference material



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for project success ...