SEI Training

Software Architecture: Principles and Practices

About the Course

Although the term software architecture is used frequently in today's software industry, its meaning is not universally understood.

- What is software architecture?
- How do you use software architectures in practice?
- What does a software architect do for an organization?
- What value does software architecture provide?

This course introduces the essential concepts of software architecture. A software architecture is an abstract view of a software system distinct from the details of implementation, algorithms, and data representation. Architecture is a crucial part of a software organization's business strategy. Software architectures can

- provide flexibility and adaptability in changing markets
- allow for interoperability with other players in the marketplace
- help developers focus on solving key technical challenges
- help manage technical risk
- guide system modernization activities
- help reduce maintenance costs and amortize development costs
- assist in workforce organization and with project oversight and control
- establish a common corporate vocabulary
- shorten learning time

This two-day course emphasizes the importance of the business and mission context in which systems are designed and introduces participants to software architectures in a real-world setting. "Industrial-strength" case studies illuminate the key technical and organizational issues for software architectures. This course is based on the book *Software Architecture in Practice, 3rd Edition*.

Objectives

This course provides attendees with a thorough overview of software architectures. After attending this course, participants will have a better understanding of

- what software architecture is
- why software architecture is important
- the relationships between system qualities and software architectures
- software architectural patterns and tactics, and their relationship to system qualities

This course is the most fundamental of the courses in the SEI Software Architecture Curriculum. At the conclusion of the course, attendees will be eligible to take the SEI's Software Architecture Design and Analysis and Architecture Tradeoff Analysis Method (ATAM) Evaluator Training courses. Attendees will also be better prepared for the SEI's Documenting Software Architectures course. This course is the first course required in the SEI's Software Architecture Professional, SOA Architect Professional, and ATAM Evaluator certificate programs.

Who Should Attend?

This course is targeted at professionals who design, develop, or manage the construction of software-reliant systems. This course is designed to help practicing software professionals quickly gain insight into the latest concepts of what software architecture is and how to use it successfully.

> "Covered topics that were new to me as opposed to those in books I previously read"
>
> "There are some practice tools/procedures I could use directly in the project I am on"
>
> "I liked the variety of real-life examples"
>
> — *Course Attendees*

Topics

The following topics are covered in this class:

- definition and overview of software architecture
- the architecture influence cycle: what influences software architects and software architecture
- understanding and achieving quality attributes
- architecture design using patterns and tactics
- documenting software architecture
- evaluating software architecture
- architecture reuse via product lines
- architectures in Agile projects

Prerequisites

Before registering for this course, participants should have

- experience in the development of software-reliant systems
- some familiarity with modern software engineering concepts

Materials

Participants receive a copy of the lecture slides and the book *Software Architecture in Practice, 3rd Edition*.

Three Ways to Attend

1. Public, instructor-led offering at an SEI office
2. Private, instructor-led training at customer sites
3. eLearning

For More Information

To learn more and to register for the course, visit

Classroom: sei.cmu.edu/training/p35.cfm
eLearning: sei.cmu.edu/training/V07.cfm

About Us

For four decades, the Software Engineering Institute (SEI) has been helping government and industry organizations to acquire, develop, operate, and sustain software systems that are innovative, affordable, enduring, and trustworthy.

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