Developing Real-Time and Embedded Software with UML 2

Duration: 3 days

Audience: Software architects, development team managers, project managers, product managers, software developers, programmers involved in design and development of real-time and embedded software systems

Pre-requisites: Participants should be familiar with the basic principles of software engineering, concurrent programming, and have some experience with object-oriented programming

Brief Description: This course teaches the essentials of applying the industry standard UML 2 language and related profiles to the development of large and complex real-time and embedded systems using agile development approaches.

Description:
The course includes a general introduction to model-based methods and technologies with special focus on the industry standard UML 2 language and related profiles as well as an overview of real-time systems issues. Methods for applying modeling technologies and related standard design patterns to the problem of designing complex real-time systems are described. In addition, the use of agile development methods to these problems is covered.

Target Audience
Real-time and/or embedded systems architects and developers; also project managers and product managers involved with the design and development of such systems

Course Level
Expert

Course Pre-requisites
Participants should be familiar with the basic principles of software engineering, concurrent programming, and have some experience with object-oriented programming

Course Objectives
Teaching how the industry-standard modeling language and related profiles and technologies can be used to develop complex real-time and embedded systems using agile approaches. Also, to cover some key design patterns that are generally applicable in the design of real-time and embedded systems.
Course Outline:

• Part 1: On Model-Driven Development
  o What is Model-Driven Development?
  o A short review of meta-modeling

• Part 2: An Overview of the Unified Modeling Language –version 2
  o Language Architecture and Semantic Foundations
  o Basic UML 2 Diagrams and Their Elements
  o Domain-specific Customization of UML: Profiles

• Part 3: Applying UML in the Design of Real-Time/Embedded Software Systems
  o The physics of software and real-time systems overview
  o The UML from a real-time programmer’s perspective
  o Elements of the Real-Time UML Standard Profile (MARTE)
  o Application of the MARTE Profile to Model Analysis
  o Introduction to agile Model-Driven Software Engineering Process

• Part 4: Software Architectures for Real-Time and Embedded Systems

Summary and Conclusions