



REAL-TIME PROGRAMMING FOR EMBEDDED SYSTEMS

COURSE DESCRIPTION

The Real-Time Programming for Embedded Systems course provides an introduction to embedded software concepts and the fundamental issues in real-time design. This course provides the foundation for all other Wind River® courses.

After this course, participants will be able to perform the following:

- Design and implement a real-time application
- Describe the capabilities of a real-time operating system
- Use good programming practices for a real-time system

PRODUCTS SUPPORTED

- Applies to all embedded software

COURSE FORMAT

- This two-day expert-led course consists of lectures.
- Participants receive individual guidance from an expert engineer who has extensive experience with Wind River technologies.

AUDIENCE

- Real-time software systems architects, project managers, technical support engineers, and technical consultants who have responsibility for designing, structuring, and implementing the software for real-time and embedded systems using a real-time operating system

PREREQUISITE SKILLS

- Some high-level programming experience
- An understanding of the hardware contained within a personal computer

PREREQUISITE COURSES

- None

RELATED COURSES

- None

Course title:	Real-Time Programming for Embedded Systems
Duration:	Two days
Format:	Instructor-led lectures and demonstrations; instructor-led Live Remote delivery available
Content:	Day 1: Project Environment; Project Design; Introduction to Embedded Software Day 2: Real-Time Programming Techniques; More Real-Time Programming Techniques; Hard Real-Time Scheduling

SYLLABUS

Day 1

PROJECT ENVIRONMENT

- Requirements
- Simulation
- Design methodology
- Reviews
- Version control
- Debugging and testing
- Change control
- Programming language
- **LAB: Creating a System Design Specification**

PROJECT DESIGN

- Hard vs. soft
- Hardware view
- Hardware options
- Context diagrams
- State machines and statecharts
- OO/UML
- **LAB: Designing a Component**

INTRODUCTION TO EMBEDDED SOFTWARE

- Real-time architectures
- Real-time operating systems
- Partitioning software into tasks
- Scheduling tasks
- **LAB: Identifying Component Tasks and Scheduling**

Day 2

REAL-TIME PROGRAMMING TECHNIQUES

- Timers
- Queues
- Semaphores and inter-task synchronization
- Inter-task data communication
- **LAB: Coding a Component Function**

MORE REAL-TIME PROGRAMMING TECHNIQUES

- Driver techniques
- Encapsulation techniques
- Miscellaneous topics
- **LAB: Accessing a Hardware Register**

HARD REAL-TIME SCHEDULING

- Real-time scheduling is not intuitive
- Basics of rate monotonic analysis
- More complex rate monotonic analysis
- Blocking problems and their solutions
- **LAB: Coding a Real-Time Component Function**

GLOBAL REACH OF WIND RIVER EDUCATION SERVICES

With more than 30 years of experience delivering software for intelligent systems, Wind River provides education services in every region of the world. Our private classes can be tailored to your needs by adding or removing topics from multiple courses. If you have more specific project challenges, Wind River Mentoring provides coaching by experienced engineers to help you integrate Wind River solutions into your environment. And when you're too busy to attend a whole class, our On-Demand Learning options provide around-the-clock access to advanced and specialized topics. All of our education services are led by expert engineers who are closely connected to the Wind River technical community for access to specific expertise.

CONTACT US

For more information about Wind River Education Services, visit www.windriver.com/education/.

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