VIRTUAL WAVES

Embedded – RTOS C programming Expert

5-days session

Title	Embedded – RTOS C programming Expert
Overview	This **5-days** training will allow current students, engineers and embedded systems enthusiasts to take a deep-dive into real time operating system architecture and mastering the C-language best practices for embedded system. During the sessions we will learn how to develop & enrich the basic RTOS by adding several stacks and services (e.g., file system, TCP/IP, IoT library, webserver). The course/training will mainly focus on the following items: ▪ From Baremetal to RTOS architectures and design cases ▪ Overview of majors RTOSs on the market ▪ Advanced C programming for embedded systems ▪ Stack and heap ▪ Pointers, hash tables and binary search trees ▪ FreeRTOS deep-dive ▪ Scheduling and pre-emption ▪ Tick and tickless scheduling ▪ Queuing techniques ▪ Memory allocation techniques ▪ Memory pools ▪ Mutex and semaphores ▪ Mailboxes ▪ Direct memory access ▪ Inter-task communication ▪ Inter-process communication ▪ Protecting shared resources ▪ Interrupt handling
Labs	▪ Download and running the FreeRTOS basic example ▪ Design and implement a linked list ▪ Design and implement a hash table ▪ Design and implement a protected memory region ▪ Synchronizing interrupt with tasks ▪ Adding a file system to the RTOS ▪ Adding the TCP/IP stack to the RTOS ▪ Adding an IoT interconnect module to the RTOS ▪ Adding a compression library to the RTOS ▪ Adding a webserver to the RTOS ▪ Instantiating a DMA transfer with the FreeRTOS ▪ Creating a CLI based interface with the FreeRTOS
Audience	Software & Firmware engineers that intend to use a real time operating system
Prerequisite	▪ Basic knowledge of embedded systems ▪ Basic knowledge in C programming
Seats	[min = 8, max = 16]
Duration	5 days – 40 hours (50% courses, 50% Labs)