

FreeRTOS on STM32: Tasks, Scheduler & IPC

Learn to configure, schedule and debug FreeRTOS tasks on STM32 using CMSIS_OS, STM32CubeMX and intertask communication methods.

32 Hours

DURATION

10

MODULES

12

TOPICS

COURSE OVERVIEW

This Online Course focuses on the utilization of CMSIS_OS v1.x based on the FreeRTOS operating system in STM32 MCU applications. Engineers will gain insights into FreeRTOS features, components, configuration options, and API functions. The course emphasizes practical knowledge, demonstrating the integration of FreeRTOS with other STM32 ecosystem components such as the HAL library and STM32CubeMX for code generation

WHO THIS COURSE IS FOR

This course is designed for engineers seeking a comprehensive understanding of FreeRTOS and its implementation with STM32 MCUs. It is particularly beneficial for those looking to enhance practical skills in CMSIS_OS v1.x based application development using FreeRTOS as the underlying operating system.

PREREQUISITES

Pre-requisite Knowledge/Skills

- Any STM32L4 based board (preferably NUCLEO or Discovery)
- 1x miniUSB A/B cable
- PC (MS Windows 7, 8, 10) with preinstalled software:
- STM32 toolchain supported by STM32CubeMX (EWARM, MDK-ARM, STM32CubeIDE, SW4STM32, TrueStudio)
- STM32CubeMX
- STM32L4-Cube library

LEARNING OBJECTIVES

Upon completion of this participants will:

- Improve their knowledge of FreeRTOS and its main features
- Enhance practical skills related to CMSIS_OS v1.x based application development using FreeRTOS
- Gain proficiency in configuring and utilizing FreeRTOS with other STM32 ecosystem components
- Learn effective debugging support for the operating system

10 Modules, 12 Topics

01

FreeRTOS Basic Features

TOPICS

- Introduction to FreeRTOS fundamentals
- Understanding task scheduling and prioritization

02

Resources Used by Operating System

TOPICS

- Exploration of hardware resources allocated by FreeRTOS

03

FreeRTOS and Its STM32CubeMX Support

TOPICS

- Integration of FreeRTOS with STM32CubeMX for code generation
- Leveraging STM32CubeMX to streamline configuration

04

Configuration of the Operating System

TOPICS

- Hands-on exercises on configuring FreeRTOS parameters

05

Memory Allocation

TOPICS

- Understanding memory allocation in FreeRTOS applications

06

FreeRTOS Scheduler

TOPICS

- In-depth exploration of FreeRTOS scheduling mechanisms

07

Tasks in FreeRTOS

TOPICS

- Practical implementation and management of tasks

08

Intertask Communication Methods

TOPICS

- Queues, semaphores, signals, and mutexes for intertask communication

09

Software Timers in Operating System

TOPICS

- Utilizing software timers for time-based operations

10

Debug Support of the Operating System

TOPICS

- Techniques for effective debugging in FreeRTOS applications

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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