

# Real Time Programming



## Component

École Nationale  
Supérieure  
d'Électrotechnique  
d'Électronique  
d'Informatique  
d'Hydraulique  
et des  
Télécommunications

## In brief

› **plugin.odf-inp:PLUGINS\_ODF\_COURSE\_NBHOURS\_TXT:** 10

› **Code:** NDG10C

## Presentation

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### Objectives

Introduction to the basic concepts and architecture of real-time kernels (notion of thread and scheduling, critical sections and synchronisation). Illustration of fixed priority based scheduling algorithms, basic principles of scheduling analysis.

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### Description

This module includes a lecture (10h) and a personal work as practical classes (10h). The lecture addresses the following topics

- Introduction to basic concepts of real-time kernels (memory management, threads and scheduling, synchronisation, time management)
- Main characteristics of synchronisation mechanisms and basic primitives (critical sections, mutual exclusion, semaphores, models)
- Principles of scheduling and deadlines (fixed priority based scheduling algorithms, Rate Monotonic Scheduling, introduction to schedulability analysis and Worst Case Execution Time evaluation)

– Examples and use of real-time kernels.

The practical work is done in groups of students and focuses on the analysis and the use of real-time kernels in industrial applications.

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## Pre-requisites

Operating systems principles, C / C++ programming

## Useful info

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### Place

› Toulouse