Real-Time Operating System for Embedded Systems (CT506)

Credits: 3-0-2-4

Winter 2020-21

Instructor : Dr. JayPrakash

Lectures : As per lecture timetable, Online mode

Laboratory : As per lab timetable

Course Abstract
The course provides knowledge about understanding foundations of real-time operating systems (RTOS) and their role in designing and building embedded systems. These key RTOS concepts play a vital role in writing software that makes use of the programming abstractions supported by modern real-time operating systems. Topics covered include: basics of developing embedded systems, understanding real-time scheduling along with operating system concepts including real-time tasks, exceptions and interrupts, IO subsystems, timer services, kernel objects, synchronization and communication, benchmarking and common design problems in real-time embedded systems. The course is based on C and Linux systems level programming.

Grading
• 2 Tests: 40%. Mid-sem and End-sem exams, each worth 20%.
• Labs: 30%. Assignment submissions count 25%, remaining 5% is for attendance.
• Projects: 20%. Programming project to be carried out.
• Viva-voce: 10%. Oral evaluation to be conducted in lab before end-sem.

Course Outcomes
Upon completion of this course, students should be able to:
• Write programs that create and handle multiple processes, threads, and sockets.
• Explain the potential problems arising from the concurrent execution of multiple processes or threads in an real-time scheduling environment.
• Write programs that use signal handlers to catch signals, I/O redirection and pipes.
• Write makefiles for modular compilation of programs with several source files.
• Understanding kernel implementation for realtime operating systems and its use as a development environment for building embedded systems.

Suggested Reading