**DEPARTMENT OF ELECTRONICS**
**Cochin University of science and Technology**

# Course Schedule

| | |
|---|---|
| **Course: M.Sc. (Electronic Science)** | **Name of Faculty: Dr. Bijoy Antony Jose** |
| **Topic: 16-305-0309Embedded Software and Real Time Systems** | **Semester: THIRD** |
| **Lecture Hall:** 118 | **Timings:** as per CBCS |

| *Week and date* | *Lecture topics* | *Assignments* | *Remarks* |
|---|---|---|---|
| Week 1 (10th July 19) | **Module 1**<br>• CPU and memory types<br>• Direct memory access | | |
| Week 2 (15thJuly 19) | • Interrupts and masking<br>• Shared Data problem<br>• Atomic operations | ***Assignment-1***<br>➢ Programming using mutex<br>➢ RTOS programming | |
| Week 3 (22nd July 19) | • Critical Section<br>• Re-entrancy<br>• Programming for critical section | | |
| Week 4 (29thJuly 19) | **Module 2**<br>• Software Architecture for Embedded System<br>• Round Robin approach<br>• Real Time operating Systems | | |
| Week 5 (5th Aug 19) | • Real Time Operating Systems<br>• Soft and Hard RTOS<br>• Task states | | |
| Week 6 (12thAug 19) | • Scheduler for OS<br>• Semaphores<br>• Programming mutex and semaphore | ***Assignment-1 submission*** | |
| Week 7 (19thAug 19) | **Module 3**<br>• Interrupt driver systems<br>• Pre-emptive priority systems<br>• Task control block | | |
| Week 8 (26th Aug 19) | First Internals | | |
| Week 9 (2nd Sep 19) | • Rate Monotonic approach<br>• Dynamic priority scheduling<br>• Earliest Deadline First | ***Assignment-2***<br>➢ Programming freeRTOS on ARM core<br>➢ Compilers and interpreters | |
| Week 10 (16th Sep 19 ) | **Module 4**<br>• Queue, Mailbox, pipes<br>• Inter-task communication | | |
| ***Onam Vacation*** | | | |

| | | | |
|---|---|---|---|
| Week 11 (23rd Sep 19) | • Blocking and non-blocking<br>• Task synchronization<br>• Deadlock, starvation | | |
| Week 12 (30thSep 19) | • Pre-emption, priority inversion<br>• Priority inheritance<br>• Priority ceiling protocol | | |
| Week 13 (14th Oct 19) | Second Internals | | |
| Week 14 (21st Oct 19) | **Module 5**<br>• Host and target machines<br>• Cross compilers<br>• Linker and locator | | |
| Week 15 (28thOct 19) | • Emulators and simulators<br>• POSIX programming | | |
| Week 16 (4th Nov 19) | • POSIX threads, Semaphores<br>• POSIX shared memory | ***Assignment-2 submission*** | |
| Week 17 (6th Nov 19) | *Publication of Sessional* | | |
| Week 18 (7th Nov 19) | **REVISION** | | |