DEPARTMENT OF ELECTRONICS
Cochin University of science and Technology

Course Schedule

Course: M.Tech. (Electronics & Communication Engineering)	**Name of Faculty: Dr. Bijoy Antony Jose**
Topic: 20-437-0101 Embedded Architecture and Interfacing	**Semester: FIRST**
Lecture Hall: 118	**Timings:** as per CBCS - A

Week and date	***Lecture topics***	***Assignments***	***Remarks***
Week 1 (23 Nov 20)	**Module 1** • Review of Processors and Embedded Systems, PIC. • Performance and power		
Week 2 (30th Nov 20)	• Moore's law, Amdahl's law • Review of architectures in academia and industry		
Week 3 (7th Dec 20)	• RISC/CISC, Flynns Classification, Endian-ness • Superscalarity, Pipelining	***Assignment-1*** ➢ Addressing modes & ISA of x86 ➢ Problems in parallel processor performance	
Week 4 (21st Dec 20)	• Throughput, Latency **Module 2** • Pentium architecture • Pipeline Hazards and conflicts		
Week 5 (4th Jan 21)	• Performance optimizations in x86 • Memory organization • Caches, multi-level cache		
Week 6 (11th Jan 21)	• Cache placement policies • Cache performance • Address Translation • Paging and virtual memory	***Assignment-1 submission***	
Week 7 (18th Jan 21)	**Module 3** • ARM architecture basics • Cortex M3 architecture		
Week 8 (25th Jan 21)	• Programming mode, registers, NVIC • Power management		
4th Feb 21	First Internals		
Week 9 (15th Feb 21)	• Multithreaded programming, Graphics processors • pThreads, Thread building blocks, GP-GPU	***Assignment-2*** ➢ ARM ISA programs ➢ Programming Arm and x86 boards	
Week 10 (22nd Feb 21)	• Hybrid architectures, GPU • NVIDIA CUDA architecture		

Week 11 (1st Mar 21)	**Module 4** • Review of PIC processor ISA • Compare, Capture, PWM • Interrupt handling		
Week 12 (8th Mar 21)	• Timing and interrupts in PIC • Cyber Physical Systems • Internet of Things • Client Server model and cloud computing		
Week 13 (15th Mar 21)	• Edge computing • Arduino, Galileo, Raspberry PI **Module 5** • Sensors and transducers • Bluetooth, Zigbee	***Assignment-2 submission***	
Week 14 (22nd Mar 21)	• Interfacing I2C, SPI, USB • ADC types		
25th March 21	Second Internals		
Week 15 (5th Apr 21)	• Interfacing RTC, PWM, LCD, Stepper motors		
10th April 21	*End of Classes*		