

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Electronics and Communication Engineering - ARM Based Development

Subject Co-ordinator - Mr. S. Chandramouleeswaran

Co-ordinating Institute - Independent Embedded SW Trainer

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Types of computer Architectures, ISA's and ARM History
- Lecture 2 - Embedded System Software and Hardware, stack implementation in ARM, Endianness, condition codes
- Lecture 3 - Processor core VS CPU core, ARM7TDMI Interface signals, Memory Interface, Bus Cycle types, Register
- Lecture 4 - Instruction Format, ARM Core Data Flow Model, ARM 3 stage Pipeline, ARM family attribute comparis
- Lecture 5 - ARM 5 stage Pipeline, Pipeline Hazards, Data forwarding - a hardware solution
- Lecture 6 - ARM ISA and Processor Variants, Different Types of Instructions, ARM Instruction set, data proces
- Lecture 7 - Shift Operations, shift Operations using RS lower byte, Immediate value encoding
- Lecture 8 - Dataprocessing Instructions
- Lecture 9 - Addressing Mode-1, Addressing Mode-2
- Lecture 10 - Addressing Mode-2, LDR/STR, Addressing mode-3 with examples
- Lecture 11 - Instruction Timing, Addressing Mode-4 with Examples
- Lecture 12 - Swap Instructions, Swap Register related Instructions, Loading Constants
- Lecture 13 - Program Control Flow, Control Flow Instructions, B & BL instructions, BX instruction
- Lecture 14 - Interrupts and Exceptions, Exception Handlers, Reset Handling
- Lecture 15 - Aborts, software Interrupt Instruction, undefined instruction exception
- Lecture 16 - Interrupt Latency, Multiply Instructions, Instruction set examples
- Lecture 17 - Thumb state, Thumb Programmers model, Thumb Implementation, Thumb Applications
- Lecture 18 - Thumb Instructions, Interrupt processing
- Lecture 19 - Interrupt Handelling schemes, Examples of Interrupt Handlers
- Lecture 20 - Coprocessors
- Lecture 21 - Coprocessor Instructions, data Processing Instruction, data transfers, register transfers
- Lecture 22 - Number representations, floating point representation
- Lecture 23 - Flynn's Taxonomy, SIMD and Vector Processors, Vector Floating Point Processor (VFP), VFP and ARM
- Lecture 24 - Memory Technologies, Need for memory Hierarchy, Hierarchical Memory Organization, Virtual Memory
- Lecture 25 - Cache Memory, Mapping Functions
- Lecture 26 - Cache Design, Unified or split cache, multiple level of caches, ARM cache features, coprocessor
- Lecture 27 - Processes, Memory Map, Protected Systems, ARM systems with MPU, memory Protection Unit (MPU)
- Lecture 28 - Physical Vs Virtual Memory, Paging, Segmentation
- Lecture 29 - MMU Advantage, virtual memory translation, Multitasking with MMU, MMU organization, Tightly coup

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- Lecture 30 - ARM Development Environment, Arm Procedure Call Standard (APCS),
- Lecture 31 - Example C program
- Lecture 32 - Embedded software Development, Image structure, linker inputs and outputs, memory map, applicati
- Lecture 33 - AMBA Overview, Typical AMAB Based Microcontroller, AHB bus features, AHB Bus transfers, APB bus
- Lecture 34 - DMA, Peripherals, Programming Peripherals in ARM
- Lecture 35 - DMA
- Lecture 36 - Protocols (I2c, SPI), UART, GPIO
- Lecture 37 - ARM ISAs, ARMv5, ARMv6, ARM v7, big.little technology, ARMv8