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NPTEL : Broadband Networks: Concepts and Technology (Electronics and Communication Engineering)

Co-ordinators : Prof. Abhay Karandikar

Lecture 32 - Metro Ethernet Access Networks

NPTEL : Digital Communication (Electronics and Communication Engineering)

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Lecture 32 - Conclusion

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NPTEL : Transmission Lines and EM Waves (Electronics and Communication Engineering)

Co-ordinators : Prof. R.K. Shevgaonkar

NPTEL : CMOS Analog VLSI Design (Electronics and Communication Engineering)

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NPTEL : NOC:Microwave Integrated Circuits (Electronics and Communication Engineering)

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NPTEL : NOC:Foundations of Wavelets and Multirate Digital Signal Processing (Electronics and Communication Engineering)

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NPTEL : RF Integrated Circuits (Electronics and Communication Engineering)

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NPTEL : NOC:Design of Power Electronic Converters (Electronics and Communication Engineering)

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NPTEL : NOC:Operation and Planning of Power Distribution Systems (Electronics and Communication Engineering)

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NPTEL : Signals and Systems (Electronics and Communication Engineering)

Co-ordinators : Prof. K.S. Venkatesh

NPTEL : Advanced 3G and 4G Wireless Mobile Communications (Electronics and Communication Engineering)

Co-ordinators : Prof. Aditya K. Jagannatham

NPTEL : Digital Switching (Electronics and Communication Engineering)

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NPTEL : NOC:Probability and Random Variables, Processes for Wireless Communications (Electronics and Communication Engineering)

Co-ordinators : Prof. Aditya K. Jagannatham

NPTEL : NOC:Estimation for Wireless Communications, MIMO, OFDM Cellular and Sensor Networks (Electronics and Communication Engineering)

Co-ordinators : Prof. Aditya K. Jagannatham

NPTEL : NOC:Error Control Coding - An Introduction to Convolutional Codes (Electronics and Communication Engineering)

Co-ordinators : Dr. Adrish Banerjee

NPTEL : NOC:Error Control Coding - An Introduction to Linear Block code (Electronics and Communication Engineering)

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Co-ordinators : Mr. S. Chandramouleeswaran

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 set, Operational Modes

Lecture 4 - Instruction Format, ARM Core Data Flow Model, ARM 3 stage Pipeline, ARM family attribute comparision

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 processing instructions

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 interactions, An example vector operation

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 15 for system control

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 coupled Memory (TCM)

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, application startup

Lecture 33 - AMBA Overview, Typical AMAB Based Microcontroller, AHB bus features, AHB Bus transfers, APB bus transfers, APB bridge

Lecture 34 - DMA, Peripherals, Programming Peripherals in ARM

Lecture 35 - DMA:Direct Memory Access

Lecture 36 - Protocols (I2c, SPI), UART, GPIO

Lecture 37 - ARM ISAs, ARMv5, ARMv6, ARM v7, big.little technology, ARMv8

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