DSP Algorithms and Architecture

Written by Administrator

Saturday, 07 November 2009 06:11 -

Subject Code		:

IA Marks		: 25

No. of Lecture Hrs/Week		: 04

Exam Hours		: 03

Total no. of Lecture Hrs.		: 52

Exam Marks		: 100

PART - A

Unit - 1

Introduction to Digital Signal Processing: Introduction, A Digital Signal-Processing System, The Sampling Process, Discrete Time Sequences, Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear Time-Invariant Systems, Digital Filters, Decimation and Interpolation.

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5 Hours

Unit - 2

Architectures for Programmable Digital Signal-Processors: Introduction, Basic Architectural Features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Features   for External Interfacing.

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8 Hours

Unit - 3

Programmable Digital Signal Processors: Introduction, Commercial Digital

Signal-processing Devices, Data Addressing Modes of TMS32OC54xx., Memory Space of
TMS32OC54xx Processors, Program Control.

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6 Hours

Unit - 4

Detail Study of TMS320C54X & 54xx Instructions and Programming, On-Chip peripherals,
Interrupts of TMS32OC54XX Processors, Pipeline Operation of TMS32OC54xx Processor.

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6 Hours

PART - B

Unit - 5

Implementation of Basic DSP Algorithms: Introduction, The Q-notation, FIR Filters, IIR
Filters, Interpolation and Decimation Filters (one example in each case).

6 Hours

Unit - 6

Implementation of FFT Algorithms: Introduction, An FFT Algorithm for DFT Computation, Overflow and Scaling, Bit-Reversed Index Generation & Implementation on the TMS32OC54xx.

6 Hours

Unit - 7

Interfacing Memory and Parallel I/O Peripherals to DSP Devices: Introduction, Memory Space Organization, External Bus Interfacing Signals. Memory Interface, Parallel I/O Interface, Programmed I/O, Interrupts and I / O Direct Memory Access (DMA).

8 Hours

Unit - 8

Interfacing And Applications of DSP Processor: Introduction, Synchronous Serial Interface, A CODEC Interface Circuit. DSP Based Bio-telemetry Receiver, A Speech Processing System, An Image Processing System.

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6 Hours

Text Book:

   1. **"Digital   Signal Processing"**, Avatar Singh   and S. Srinivasan, Thomson Learning, 2004.

Reference Books:

   1. **Digital   Signal Processing: A practical approach**, Ifeachor E. C., Jervis B. W   P earson-Education, PHI/

2002

   2. **"Digital   Signal Processors"**, B   Venkataramani and M Bhaskar TMH,   2002

   3. **"Architectures   for Digital Signal Processing"**, Peter   Pirsch John Weily, 2007