**EC8T2A**   **DSP Processors and Architectures**   **Credits: 3**

**Lecture: 3 periods/week**   **Internal assessment: 30 marks**
**Tutorial: 1 period /week**   **Semester end examination: 70 marks**

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**Prerequisites:** Computer Architecture & Organization (EC5T3)
**Course Objectives:**

* The purpose of this course is to introduce the concepts of DSP Processor and its architectures.
* To program DSP Processor for various applications.

**Learning Outcomes**:

Student will be able to
* Select appropriate DSP processor for the required computational accuracies in DSP implementation.
* Implement DSP algorithms using DSP processors such as TMS 320C6X,TMS320C54X & its interfacing techniques with various I/O peripherals
* Effectively use MATLAB DSP toolbox for analysis & design of DSP system.

**UNIT-I**
**Computational Accuracy in DSP Implementations**: Number Formats for Signals and Coefficients in DSP Systems, Dynamic Range and Precision, Sources of Error in DSP Implementations, A/D Conversion Errors, DSP Computational Errors, D/A Conversion Errors.

**UNIT-II**
**Architectures for Programmable DSP Devices:** Basic Architectural Features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External Interfacing.

**UNIT-III**
**Programmable Digital Signal Processors:** Commercial Digital Signal-Processing Devices, Architecture of TMS320C54XX, TMS320C6X, Addressing modes and Assembly language instructions of TMS320C54XX, TMS320C6X.

**UNIT-IV**
**Application Programs in TMS320C54XX:** Pipeline operations, Code Composer Studio, Example programs.

**UNIT-V**

**TMS320C6X Application Programs and Peripherals:** Application programs in C64X, C67X, Internal memory, external memory, on-chip peripherals

## Learning Resources

**Text Books:**

1. Digital Signal Processors (Architecture, programming and applications), B.Venkataramani and M.Bhaskar, Tata McGraw Hill Education pvt. Ltd., Second edition.
2. Digital Signal Processing, Avatar Singh and S.Srinivasan, Cengage learning 2004.

**References:**

1. Digital Signal Processing, Jonatham Stein, John Wiley , 2005

**Web Resources:**

1. http://en.wikipedia.org/wiki/Digital_signal_processor
2. http://www.scribd.com/doc/8968585/Architecture-of-DSP-Processors