# TECHNOLOGY LEARNING CENTER ...Finishing School for Engineer's

#### Workshop on Digital Signal Processing:

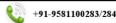
This Workshop prepares you to develop, G-programming, Digital Signal Processing and Digital Image Processing applications using Lab VIEW.

It is to develop a complete working set of digital signal processing notions from the ground up. DSP is arguably at the heart of the "digital revolution" that, in the space of just a few decades, has enabled unprecedented levels of interpersonal communication and of information availability along with image processing.

In the class, starting from the basic definitions of a discrete-time signal, we will work our way through Fourier analysis, filter design, sampling, interpolation and quantization to build a DSP toolset complete enough to analyze a practical communication system in detail. And also image processing and two-dimensional (2D) Fourier analysis. Filtering, compression and JPEG compression standard.

Hands-on examples and demonstration will be routinely used to close the gap between theory and practice.





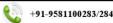
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#### Workshop Schedule

#### DAY 1

- ➤ Lab VIEW Environment
- Front Panel
- ➤ Block Diagram
- ➤ Basic programming Lab VIEW
- > Dataflow Programming
- > Lab VIEW Help and Manuals
- > Arithmetic operations
- > Boolean operations
- ➤ Debugging a VI
- ➤ Sub Vis
- > Icon and Connector Pane
- ➤ Using Sub Vis
- > Creating a Sub VI
- ➤ While Loop



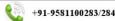


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- ➤ For Loop
- > Accessing Previous Loop Data
- > Activity: Solving Mind Game

- Case structure
- > Case structures with Boolean
- > Case structures with number of cases
- Introduction to Arrays
- > Auto Indexing Arrays
- > Array Functions
- > Polymorphism
- > Strings and its functions
- > Introduction to Clusters
- Cluster Functions
- ➤ Error Chisters
- Display message VI
- > Activity: Developing traffic light signalling systems



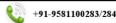


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#### DAY 2

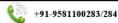
- ➤ Waveform Charts
- ➤ Waveform and XY Graphs
- > Intensity Graphs
- > Decision making with the Select function
- Formula Nodes
- ➤ About file I/O operations
- > How to use the high-level File I/O Vis
- > How to use the low-level File I/O Vis
- > How to format text files for use in spreadsheets
- ➤ SIGNAL PROCESSING module
- > Sine wave generation
- > Saw tooth & Triangular wave generation
- > Addition of noise to the signals





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- ➤ IMAGE PROCESSING module
- > Acquiring the image
- > Reading image data using IMAO function
- > Removal of noise from image
- > HAR Wavelets
- > IMAQ practical analysis report
- > IMAQ quantifying
- > Filtering the image
- > Extracting wavelet bands
- > Detecting texture defects
- > Image comparisons
- > Activity: Project "What Could Have Seen"



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#### Take away for the Participant:

- ➤ Learn & Interact with renowned Industry Experts
- > Become comfortable with the LABVIEW environment and data flow execution
- > Skill Set to develop Projects based on DSP & DIP

#### Benefits of the participants

- Certificate of Participation to all Participants from Technology Learning Center
- Free Softcopy of workshop content
- Technology Learning Center summer Training Redemption Coupon

#### Our Requirement for the program:

- Minimum of 50 teams for conducting the workshop
- One Computer CD-ROM drive for each team or students are requested to get their laptop preferably with Windows OS.
- · LCD projector and microphone PA system.
- Seminar hall or computer lab for conducting the workshop.

#### Workshop Duration:

• 2 Days [7 Hours/Day]

#### Pre-requisites:

The modules are designed in order to cater the basics of Robotics and coding however following prerequisites will be an added advantage.

- · Basic knowledge of signals and systems.
- · Basic signaling techniques.



