

SUMMER TRAINING PROGRAM 2013

(MATLAB)

Introduced By:



In Association with:



YD Tech Sourcing Pvt. Ltd.

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Summer Training Program 2013

- ❖ **Course Name:** MATLAB
- ❖ **Course Duration:** 45 Days, 80/90 hrs
- ❖ **Course Fee:** INR 8900 (Including Taxes)
- ❖ **Course Certification:** Certified by Matbotrix Technologies (Regd.) & YD Tech Sourcing Pvt. Ltd.
- ❖ **Course Level:** Advanced Level
- ❖ **Robotics Toolkit:** Free to Each Participant
- ❖ **Study Material:** Books & CDs free to each participant
- ❖ **Group discount:** Up to 15%
- ❖ **Website:** <http://www.matbotrix.com>

Course Content

Introduction to MATLAB:

- Historical Background
- Applications
- Scope of MATLAB
- Importance of MATLAB for Engineers
- Features
- MATLAB Windows(Editor, Work Space, Command History, Command Window)
- Operations with Variables
- Naming and Checking Existence
- Clearing Operations
- Introduction to Arrays
- MATLAB File Types
- How to open, quit and work on command window
- Discussing about important command used in command window
- Work space

- Command history
- How to use HELP and WEB HELP
- Some important matrix operations
- Introduction to some operators
- Introduction to M-file editor
- Editing and debugging M-files
- Basic plotting functions
- Creating plot
- Editing plot
- Solving Quadratic equations.
- How to make functions in MATLAB.
- How to solve calculus in MATLAB.

Image Processing Toolbox in MATLAB:

- Types of images
- Types of image compression & standard like JPEG, GIF
- Image Arithmetic
- Coordinate Systems
- Displaying images etc.
- Basic image related functions

Image Arithmetic:

- Addition
- Subtraction
- Multiplication
- Division
- Complement

Filtering:

- Convolution
- Correlation

- Noise Model
- Types of Noise
- Types of Filters (averaging, laplacian, median etc.)
- Filter Design
- Use of imfilter function
- How to remove noises from grey and colour images.

Spatial Transformation

- Interpolation
- Zooming
- Resizing
- Rotation
- Cropping
- Contrasting
- Image Sequences

Morphological Operations:

- Dilation
- Erosion
- Closing & opening
- Reconstruction
- Thinning & Thickening
- Boundary Extraction
- Region Filling

- Hit or Miss Transformation
- Pruning

Analysing and Enhancing Images:

- Pixel values & Statistics
- Image Analysis
- Image Enhancement
- Image Transformation
 1. Grey level slicing without background
 2. Grey level slicing with background
 3. Power law transform
 4. Logarithmic Transformation

Image Acquisition Toolbox:

- How to open camera using MATLAB.
- Capturing a image
- Image Sequencing

Miscellaneous:

- Data Acquisition toolbox
- Deploying Toolbox
- Conversion to different colour spaces
- Blurring
- Image matching

- Motion detection
- Edge Detection
- Image Segmentation



Microcontroller (AVR Atmega16):

1. Basics of Electronics (for e.g electronic components)

2. Introduction to Microcontrollers

3. Types of Motors

- AC motor
- DC motor
- Stepper motor
- Servo motor
- DC geared motor

4. MOTOR CONTROLLING CIRCUITS IC'S

- LM358(dual op- amp)
- LM35(Temperature sensor)
- L293D(dual H-bridge IC)
- 7805(Voltage regulator)

5. INTRODUCTION TO EMBEDDED C PROGRAMMING

- Embedded C-Programming.
- Introduction to C
- Flow control statements
- How to use functions in C..
- Data types, operators and expressions.
- Program debugging.
- Program burning and execution

6. PIN DESCRIPTION & ARCHITECTURE OF AVR MICROCONTROLLER, MEMORY ARCHITECTURE OF ATMEGA16.

7. LED INTERFACING

- Pattern generation using led panel .

8. LCD INTERFACING

- To move data on LCD
- To display data on both rows
- Scrolling message display on LCD in 4 and 8 bits Mode.

9. SWITCH & KEYPAD INTERFACING

- Introduction to Switches & Keyboard Matrix
- Interfacing Circuit of Switches & Keyboard Matrix
- Programming of Keyboard Matrix & Switches
- Controlling of LED's by using Switches
- Key board Matrix & LCD Interfacing Program

10. SENSORS

- IR Sensors
- Temperature Sensors
- Sound Sensors
- Touch Sensors

11. USART

- Introduction to USART
- Synchronous and Asynchronous serial Communication
- Difference between SPI,I2C and UART
- USART Registers
- Programming USART

12. Introduction to ZigBee (XBee)

Practical Projects (15 Projects);

- Ball follower Robot using image processing
- Line Follower robot using IR sensors.
- Intelligent Line Following Robot
- Communication through USART
- Moving Message display
- Laser controlled robot based on image processing
- AVR & matlab based three colour sensing robot.
- Matlab based home automation using Rf.
- AVR & matlab based red color tracking robot.
- Matlab based controlled robot with wireless camera and obstacle sensor.
- GUI Based Robot.
- GUI Based Calculator.
- Controlling Mouse Cursor using Image Processing.
- Real Time Object Separation using Image Processing
- Mobile controlled laptop using AVR and MATLAB.

Industry Interface Program

Projects

- 1 Assignment / Mini Project
- 1 Major Project

Domains / Industry

- Design
- Architecture
- Computer Science
- Electricals and Electronics