



5-Day Workshop on MATLAB and Simulink

Date: 24 July 2018

Patron

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Director, NIT Kurukshetra

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Respected Sir/Madam

School of VLSI Design and Embedded Systems, and Design Tech Systems Ltd. are jointly organizing “5-day workshop on MATLAB and Simulink” for faculty and students of NIT Kurukshetra during July 30 to August 3, 2018.

The workshop is open for faculty and students (M.Tech., Ph.D.) who are pursuing MATLAB based research work leading to system and algorithm modeling. Only 30 participants will be admitted to the workshop on first come first served basis. Faculty members will be given priority.

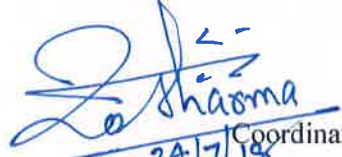
Resource person (the trainers) will be from Math Works.

The list of content to be delivered during the workshop is enclosed.

The interested participant should forward their consent through proper channel in enclosed format and should be emailed to nitkkr.sve@gmail.com latest by 5:00 PM on 27 July, 2018.

Venue of Workshop	:	VLSI Design Lab of the School
Daily Timings	:	10:00 AM - 5:00 PM
Pre Lunch Tea Break	:	11:30 AM - 11:45 AM
Lunch Break	:	1:00 PM - 2:00 PM
Post Lunch Tea Break	:	3:30 PM - 3:45 PM

Note: Workshop details are also available on institute website.


Coordinator
Prof. (Dr.) R.K. Sharma
24/7/18

School of VLSI Design and Embedded Systems

Copy to:

- All Deans, HODs and Coordinators of School.
- Notice Board of all Departments, School, CCN and Hostels.
- Senior secretary to Registrar for kind information of the Registrar.
- Senior secretary to Director for kind information of the Director.
- P/I CCN for uploading the information on Institute website (CD Enclosed).

5-Day Workshop on MATLAB and Simulink

(July 30 to August 3, 2018)

REGISTRATION FORM
(For Faculty)

Name:

Designation:.....

Qualifications:

Experience:..... Years... .. Months.

Age..... M / F

Organization:.....

Address for correspondence:

.....
.....

Mob.....

E-mail:.....

Signature of Applicant

Signature of Head of Department with Seal

5-Day Workshop on MATLAB and Simulink

(July 30 to August 3, 2018)

REGISTRATION FORM
(For M.Tech. / Ph.D. Students)

Name:

Course/Branch:.....

Roll No.....Semester.....

Age..... M / F

Organization:.....

Address for correspondence:

.....

.....

Mob.....

E-mail:.....

Signature of Applicant

Signature of Head of Department with Seal

MATLAB Fundamentals

Prerequisites

- Undergraduate-level mathematics and experience with basic computer operations

30th July 2018

Working with the MATLAB User Interface	<p>Objective: Become familiar with the main features of the MATLAB integrated design environment and its user interfaces. Get an overview of course themes.</p> <p>Reading data from files Saving and loading variables Plotting data Customizing plots Exporting graphics for use in other applications</p>
Variables and Commands	<p>Objective: Enter MATLAB commands, with an emphasis on creating variables, accessing and manipulating data in variables, and creating basic visualizations. Collect MATLAB commands into scripts for ease of reproduction and experimentation.</p> <p>Entering commands Creating numeric and character variables Making and annotating plots Getting help Creating and running live scripts</p>
Analysis and Visualization with Vectors	<p>Objective: Perform mathematical and statistical calculations with vectors. Use MATLAB syntax to perform calculations on whole data sets with a single command. Organize scripts into logical sections for development, maintenance, and publishing.</p> <p>Performing calculations with vectors Accessing and modifying values in vectors Formatting and sharing live scripts</p>

31st July 2018

Analysis and Visualization with Matrices	<p>Objective: Use matrices as mathematical objects or as collections of (vector) data. Understand the appropriate use of MATLAB syntax to distinguish between these applications.</p> <p>Creating and manipulating matrices Performing calculations with matrices Calculating statistics with matrix data Visualizing matrix data</p>
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31 st July 2018	
Tables of Data	<p>Objective: Import data as a MATLAB table. Work with data stored as a table.</p> <ul style="list-style-type: none"> Storing data as a table Operating on tables Extracting data from tables Modifying tables
Conditional Data Selection	<p>Objective: Extract and analyze subsets of data that satisfy given criteria.</p> <ul style="list-style-type: none"> Logical operations and variables Finding and counting Logical indexing
Organizing Data	<p>Objective: Organize table data for analysis. Represent data using appropriate native MATLAB data types.</p> <ul style="list-style-type: none"> Combining tables of data Table metadata Dates and durations Discrete categories

1 st Aug 2018	
Analyzing Data	<p>Objective: Perform typical data analysis tasks in MATLAB, including importing data from files, preprocessing data, fitting a model to data, and creating a customized visualization of the model.</p> <ul style="list-style-type: none"> Importing from spreadsheets and delimited text files Dealing with missing data Plotting functions Customizing plots
Increasing Automation with Programming Constructs	<p>Objective: Create flexible code that can interact with the user, make decisions, and adapt to different situations.</p> <ul style="list-style-type: none"> Programming constructs User interaction Decision branching Loops

1st Aug 2018

**Increasing
Automation
with
Functions**

Objective: Increase automation by encapsulating modular tasks as user-defined functions. Understand how MATLAB resolves references to files and variables. Use MATLAB development tools to find and correct problems with code.

- Creating functions
- Calling functions
- Setting the MATLAB path
- Debugging with the MATLAB Editor
- Using breakpoints
- Creating and using structures

Simulink for System and Algorithm Modeling

Prerequisites

MATLAB Fundamentals

2 nd Aug 2018	
Creating and Simulating a Model	<p>Objective: Create a simple Simulink model, simulate it, and analyze the results.</p> <p>Introduction to the Simulink interface Potentiometer system System inputs and outputs Simulation and analysis</p>
Modeling Programming Constructs	<p>Objective: Model and simulate basic programming constructs in Simulink.</p> <p>Comparisons and decision statements Vector signals PWM conversion system Zero crossings MATLAB Function block</p>
Modeling Discrete Systems	<p>Objective: Model and simulate discrete systems in Simulink.</p> <p>Discrete signals and states PI controller system Discrete transfer functions and state-space systems Multirate discrete systems</p>
Modeling Continuous Systems	<p>Objective: Model and simulate continuous systems in Simulink.</p> <p>Continuous states Throttle system Continuous transfer functions and state-space systems Physical boundaries</p>

3 rd Aug 2018	
Solver Selection	<p>Objective: Select a solver that is appropriate for a given Simulink model.</p> <ul style="list-style-type: none"> Solver behavior System dynamics Discontinuities Algebraic loops
Developing Model Hierarchy	<p>Objective: Use subsystems to combine smaller systems into larger systems.</p> <ul style="list-style-type: none"> Subsystems Bus signals Masks
Modeling Conditionally Executed Algorithms	<p>Objective: Create subsystems that are executed based on a control signal input.</p> <ul style="list-style-type: none"> Conditionally executed subsystems Enabled subsystems Triggered subsystems Input validation model
Combining Models into Diagrams	<p>Objective: Use model referencing to combine models.</p> <ul style="list-style-type: none"> Subsystems and model referencing Model referencing workflow Model reference simulation modes Model workspaces Model dependencies
Creating Libraries	<p>Objective: Use libraries to create and distribute custom blocks.</p> <ul style="list-style-type: none"> Creating and populating libraries Managing library links Adding a library to the Simulink Library Browser