



Vishwaniketan's  
**Institute of Management Entrepreneurship  
& Engineering Technology [i MEEET]**

Affiliated to University of Mumbai, Approved by AICTE, N

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**Academic Year 2022-23**

**EVEN SEM**

**Department of Electrical Engineering**

**Value Addition Program (VAP)**

Date: 14/01/2023

Notice no:

**Value Addition Program (VAP) : MATLAB Programming and SIMULINK (by MATHWORK)**

All SE Electrical Students are hereby informed that VAP for MATLAB Programming and SIMULINK (by MATHWORK) is scheduled in next week i.e from Monday, 16<sup>th</sup> Jan 2023.

Attendance of all SEM IV SE Elect Students is mandatory.

VAP Details: MATLAB Programming and SIMULINK (by MATHWORK)

Venue : Application Software Lab D103

Trainer Details : Prof.Nikhil N Kasar, Asst Professor, Dept of Electrical Engineering, VIMEET

Prof. Nikhil N Kasar

Dr.Sharvari Sane

Mr.Valbhav Ajmire

Dr.Vikas Shinde

Faculty Coordinator

HOD

VAP Coordinator

Director,

VAP SE EE

Dept of Elect Engg

VIMEET, Khalapur

PBLCOE, VIM



# MATLAB® Basic Functions Reference

## MATLAB Environment

<code>clc</code>	Clear command window
<code>help fun</code>	Display in-line help for fun
<code>doc fun</code>	Open documentation for fun
<code>load("filename","vars")</code>	Load variables from .mat file
<code>uiimport("filename")</code>	Open interactive import tool
<code>save("filename","vars")</code>	Save variables to file
<code>clear item</code>	Remove items from workspace
<code>examplescript</code>	Run the script file named examplescript
<code>format style</code>	Set output display format
<code>ver</code>	Get list of installed toolboxes
<code>tic, toc</code>	Start and stop timer
<code>Ctrl+C</code>	Abort the current calculation

## Operators and Special Characters

<code>+, -, *, /</code>	Matrix math operations
<code>.*, ./</code>	Array multiplication and division (element-wise operations)
<code>^, .^</code>	Matrix and array power
<code>\</code>	Left division or linear optimization
<code>.' , '</code>	Normal and complex conjugate transpose
<code>=, &lt;=, &lt;, &gt;, &lt;=, &gt;=</code>	Relational operators
<code>&amp;&amp;,   , ~, xor</code>	Logical operations (AND, NOT, OR, XOR)
<code>;</code>	Suppress output display
<code>...</code>	Connect lines (with break)
<code>% Description</code>	Comment
<code>'Hello'</code>	Definition of a character vector
<code>"This is a string"</code>	Definition of a string
<code>str1 + str2</code>	Append strings

## Special Variables and Constants

<code>ans</code>	Most recent answer
<code>pi</code>	$\pi=3.141592654\dots$
<code>i, j, 1i, 1j</code>	Imaginary unit
<code>NaN, nan</code>	Not a number (i.e., division by zero)
<code>Inf, inf</code>	Infinity

## Defining and Changing Array Variables

<code>a = 5</code>	Define variable a with value 5
<code>A = [1 2 3; 4 5 6]</code> <code>A = [1 2 3 4 5 6]</code>	Define A as a 2x3 matrix "space" separates columns ";" or new line separates rows
<code>[A,B]</code>	Concatenate arrays horizontally
<code>[A;B]</code>	Concatenate arrays vertically
<code>x(4) = 7</code>	Change 4th element of x to 7
<code>A(1,3) = 5</code>	Change A[1,3] to 5
<code>x(5:10)</code>	Get 5th to 10th elements of x
<code>x(1:2:end)</code>	Get every 2nd element of x (1)
<code>x(x&gt;6)</code>	List elements greater than 6
<code>x(x==10)=1</code>	Change elements using condition
<code>A(4,:)</code>	Get 4th row of A
<code>A(:,3)</code>	Get 3rd column of A
<code>A(6, 2:5)</code>	Get 2nd to 5th element in 6th row
<code>A(:, [1 7])=A(:, [7 1])</code>	Swap the 1st and 7th column
<code>a:b</code>	[a, a+1, a+2, ..., a+n] with a=1
<code>a:ds:b</code>	Create regularly spaced vector with spacing ds
<code>linspace(a,b,n)</code>	Create vector of n equally spaced values
<code>logspace(a,b,n)</code>	Create vector of n logarithmic values
<code>zeros(m,n)</code>	Create m x n matrix of zeros
<code>ones(m,n)</code>	Create m x n matrix of ones
<code>eye(n)</code>	Create a n x n identity matrix
<code>A=diag(x)</code>	Create diagonal matrix from vector x
<code>x=diag(A)</code>	Get diagonal elements of matrix A
<code>meshgrid(x,y)</code>	Create 2D and 3D grids
<code>rand(m,n), randi</code>	Create uniformly distributed random numbers or integers
<code>randn(m,n)</code>	Create normally distributed random numbers

## Complex Numbers

<code>i, j, 1i, 1j</code>	Imaginary unit
<code>real(z)</code>	Real part of complex number
<code>imag(z)</code>	Imaginary part of complex number
<code>angle(z)</code>	Phase angle in radians
<code>conj(z)</code>	Element-wise complex conjugate



**ViMEET, Khalapur**

**Academic Year 2022-23**

**SEM IV**

**Department of Electrical Engineering**

**Value Addition Programme (VAP)**

**Date: 02/01/2023**

• **List of Projects :**

Name of VAP Technology :	<b>MATLAB Programming and SIMULINK (by MATHWORK)</b>
List of projects:	<ol style="list-style-type: none"><li>1. Power System Faults Analysis using MATLAB Programming / Simulink Modelling</li><li>2. Design of Transformer with multiple output voltage levels using MATLAB Simulink</li><li>3. Design of Solar PV Power Generation using MATLAB Simulink</li><li>4. Modelling and analysis of Transmission line in Power System Network using MATLAB Programming / Simulink Modelling</li><li>5. Design of DC-DC Converter circuits using MATLAB Simulink</li><li>6. Design of Inverter Circuits using MATLAB Simulink</li></ol>

	<b>7. Design of Solar PV Battery Charger using MATLAB Simulink</b>
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Director  
PBLCOE, ViMEET, Khalapur

Sr.no	Name of Student	Topic of VAP Project
1	Kundan Vipinendar Sharma (Roll no:43)	Design of Transformer with multiple output voltage



		levels using MATLAB Simulink
2	Paras Anant Mhatre (Roll no 25) Yash Rajesh Patil (Roll no. 36)	Design of Solar PV Power Generation using MATLAB Simulink
3	Manali Dattaram Mhatre (Roll no 24)	Design of DC-DC Converter circuits using MATLAB Simulink
4	Dishant Sandip Mhatre (Roll no 23)	Design of Inverter Circuits using MATLAB Simulink
5	Ashish Dinesh Jaware (Roll no 15) Rohit Bhosale (Roll no 03)	Design of Solar PV Battery Charger using MATLAB Simulink

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## Value Addition Programme (VAP)

### Attendance Sheet

Name of VAP Technology :	<b>MATLAB Programming and SIMULINK (by MATHWORK)</b>
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Date: 16/01/2023

Sr.no	Name of Student	Topic of VAP Project	Morning Session	Afternoon Session
1	Kundan Vipinendar Sharma (Roll no:43)	Design of Transformer with multiple output voltage levels using MATLAB Simulink		
2	Paras Anant Mhatre (Roll no 25) Yash Rajesh Patil (Roll no. 36)	Design of Solar PV Power Generation using MATLAB Simulink		
3	Manali Dattaram Mhatre (Roll no 24)	Design of DC-DC Converter circuits using MATLAB Simulink		
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## Attendance Sheet

Name of VAP Technology :	<b>MATLAB Programming and SIMULINK (by MATHWORK)</b>
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Date: 17/01/2023

Sr.no	Name of Student	Topic of VAP Project	Morning Session	Afternoon Session
1	Kundan Vipinendar Sharma (Roll no:43)	Design of Transformer with multiple output voltage levels using MATLAB Simulink		
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Date: 02/01/2023

• **Syllabus of Value Addition Programme :**

Name of VAP Technology :	<b>MATLAB Programming and SIMULINK (by MATHWORK)</b>
Contents of VAP:	<ol style="list-style-type: none"><li><b>1. Engineering Mathematics:</b><ol style="list-style-type: none"><li>a. Mathematical Functions</li><li>b. MATLAB Commands related to function</li><li>c. Problem Solving</li></ol></li> <li><b>2. Fundamentals of MATLAB Programming:</b><ol style="list-style-type: none"><li>a. Programming Functions</li><li>b. Loop Control Commands (IF, FOR etc.)</li><li>c. Problem Solving</li></ol></li> <li><b>3. Graphics:</b><ol style="list-style-type: none"><li>a. FIGURE</li><li>b. Plots (2D Plots, 3D Plots)</li><li>c. Plot Commands</li><li>d. Plot Edit Commands</li><li>e. Problem Solving</li></ol></li> <li><b>4. Electrical Circuit Analysis using MATLAB Programming:</b><ol style="list-style-type: none"><li>a. DC Circuit Analysis</li><li>b. Network Theorem Problems</li><li>c. Problem Solving</li></ol></li> <li><b>5. Introduction to SIMULINK:</b><ol style="list-style-type: none"><li>a. Basic Blocks</li><li>b. Library Manager</li><li>c. Examples of Modelling in Simulink</li><li>d. Problem Solving</li></ol></li></ol>



**6. Application of SIMULINK in Electrical Engineering:**

- a. Basic Circuit Modelling
- b. Power Electronics Circuits
- c. Solar PV Modelling Circuits
- d. Problem Solving

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