MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

SANTOSH, TANGAIL-1902

DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY

Course Title: Data Communication Lab

Course Code: ICT-3102

Experiment Name: Installation of Matlab

Lab Report No: 01

Submitted By	Submitted To
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21/5/25

Date of Performance: 14/05/2025

Date of Submission: 21/05/25

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Experiment no: 01
Experiment name: Installation of Matlab

Introduction: MATLAB (Matrix Laboratory) is a programming platform designed specifically for engineers and scientists. It combines a desktop environment tuned for iterative analysis and design processes with a programming language that expresses matrix and array mathematics directly.

Installing MATLAB correctly is essential for using it in coursework, research, and professional engineering tasks. This lab focused on familiarizing students with the installation procedure of MATLAB on a Windows/Mac/Linux operating system.

Objectives: The objective of this lab session was to successfully install MATLAB, a high-performance language for technical computing, on a personal computer. The installation process included downloading the software, activating the license, and verifying that all necessary toolboxes and components were properly installed.

Required Instruments:

1. A computer with a compatible operating system
2. Internet connection.
3. MATLAB license (student or academic license)
4. MathWorks account
5. Administrative privileges on the computer

Procedure:

Step 1: Creating a MathWorks Account

- Visited https://www.mathworks.com.
- Clicked on "Sign In" and then "Create Account".
- Entered academic email, name, and other required details.
- Verified the email and completed the account setup.

Step 2: Downloading MATLAB

- Logged into the MathWorks account.
- Navigated to "Download MATLAB".
- Selected the latest release (e.g., MATLAB R2024a).
- Chose the appropriate operating system and downloaded the installer.

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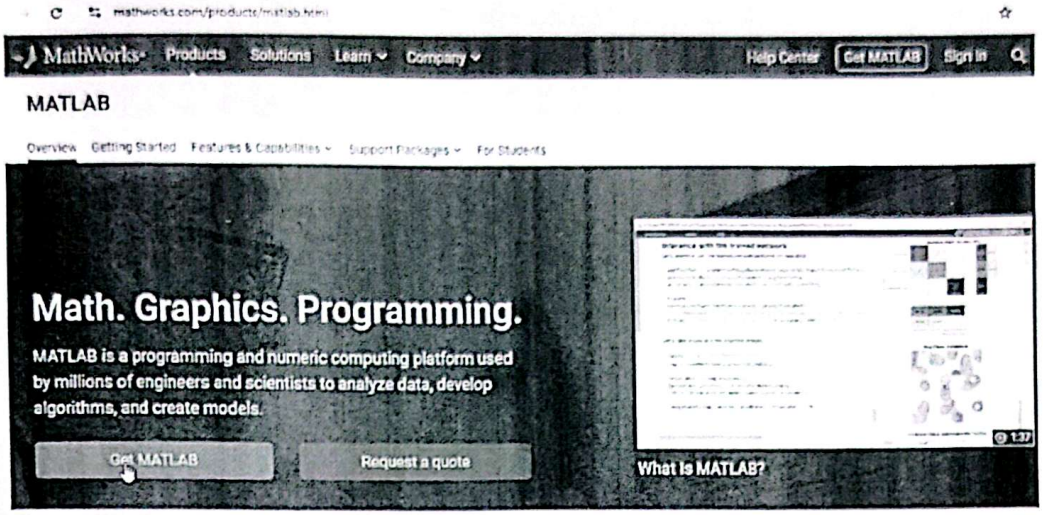
mathworks.com/products/matlab.html
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MATLAB is a programming and numeric computing platform used by millions of engineers and scientists to analyze data, develop algorithms, and create models.
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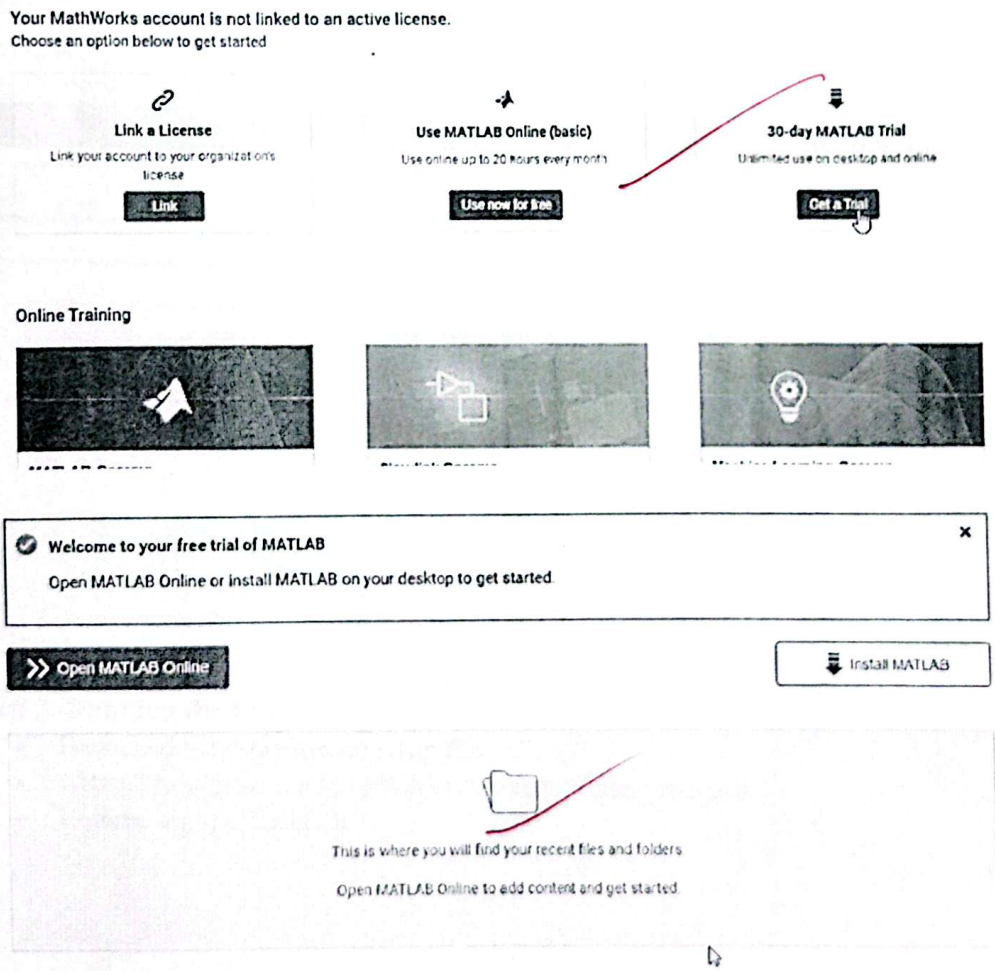
What Is MATLAB?


Your MathWorks account is not linked to an active license.
Choose an option below to get started
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Link your account to your organization's license
Link
Use MATLAB Online (basic)
Use online up to 20 hours every month
Use now for free
30-day MATLAB Trial
Unlimited use on desktop and online
Get a Trial
Online Training
Welcome to your free trial of MATLAB
Open MATLAB Online or install MATLAB on your desktop to get started.
Open MATLAB Online
Install MATLAB
This is where you will find your recent files and folders.
Open MATLAB Online to add content and get started.

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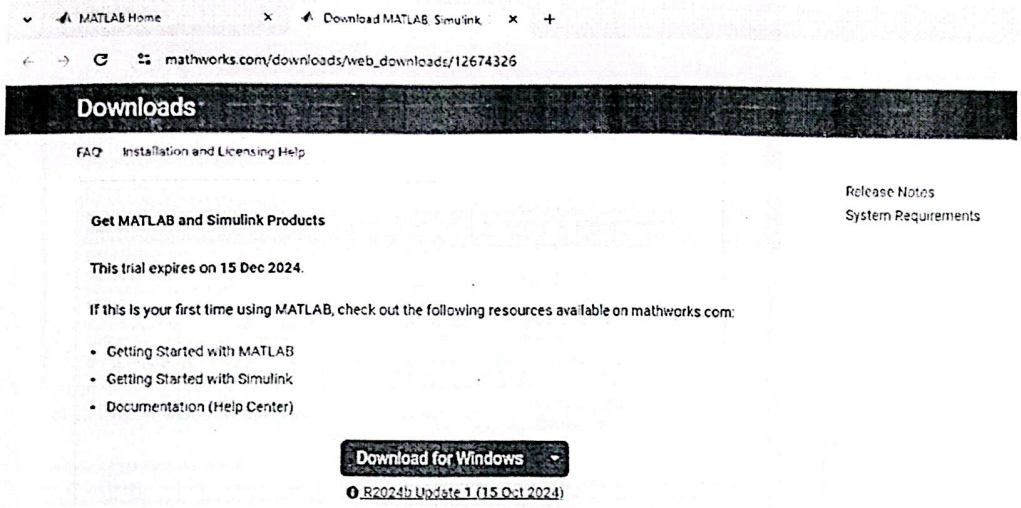

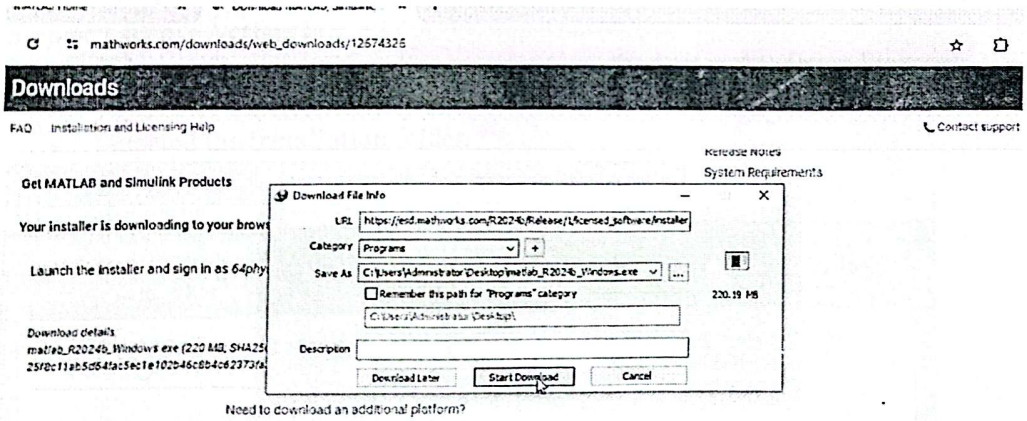

tep 3: Running the Installer

- Launched the downloaded setup file.
- Chose "Log in with a MathWorks Account" when prompted.
- Entered login credentials.

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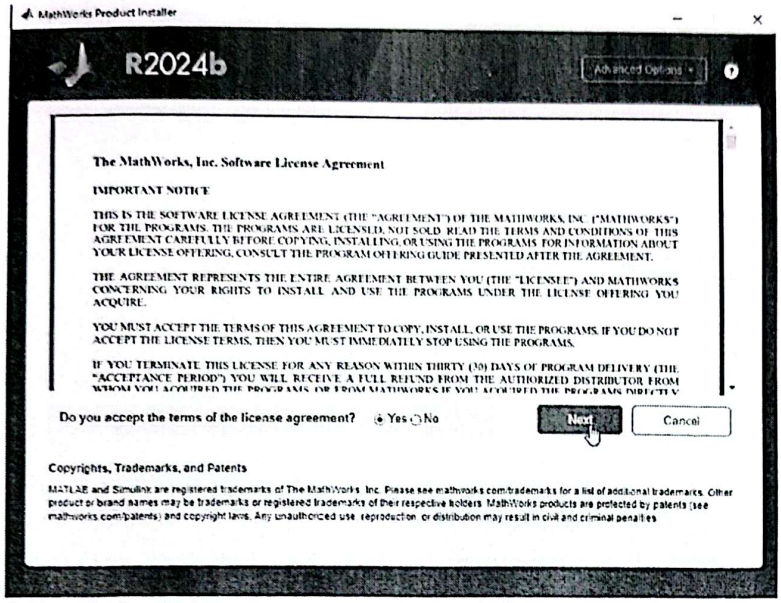
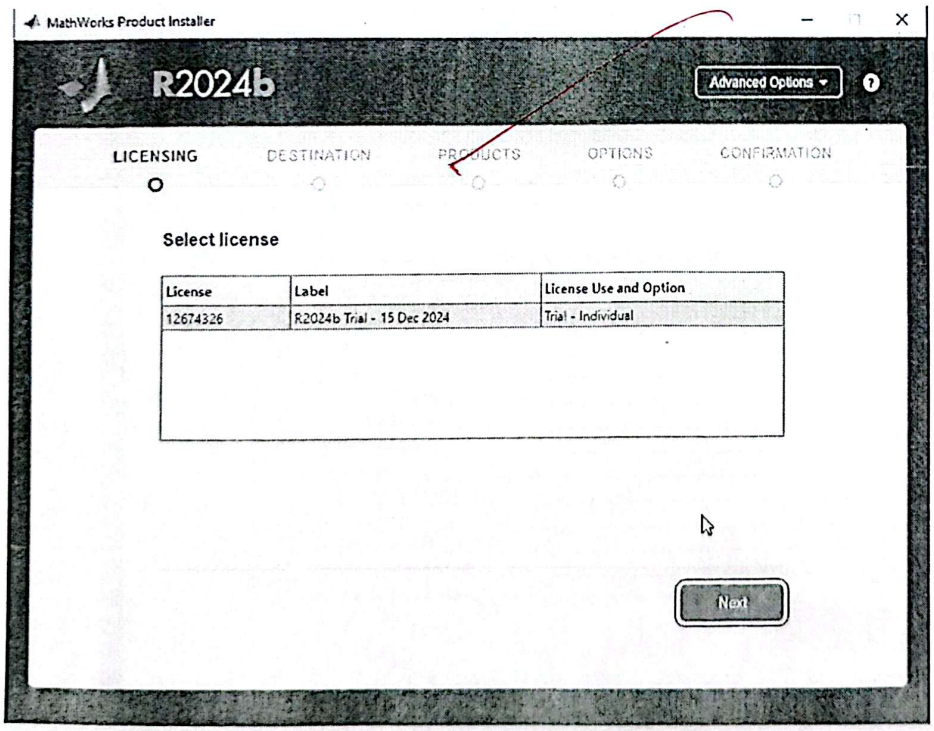


Step 4: License Activation

- Selected the appropriate license type (e.g., Student or Academic License).
- Agreed to the terms and conditions.
- Selected the installation folder.



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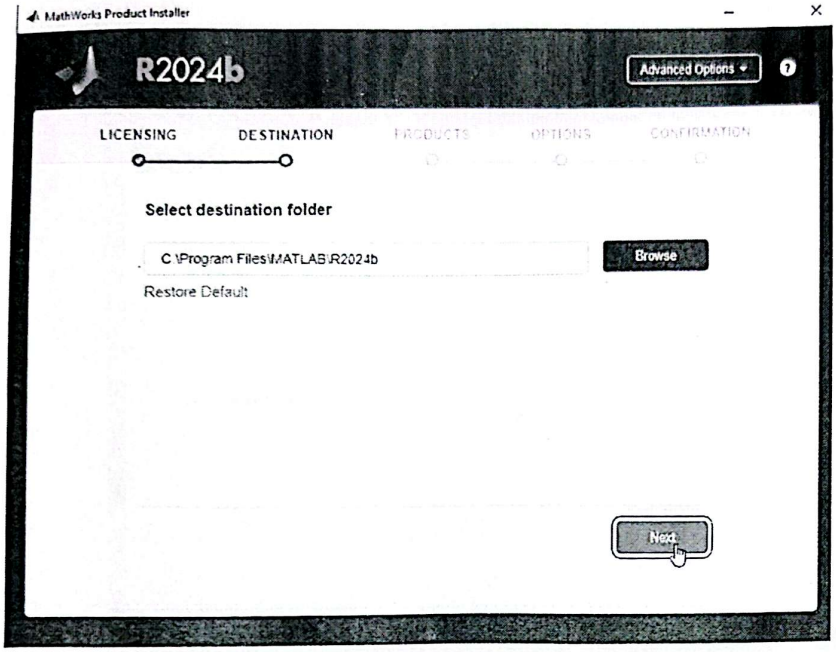

Step 5: Selecting Products to Install

- Chose required toolboxes (e.g., Simulink, Signal Processing Toolbox).
- Began installation. The process took 15–60 minutes depending on internet speed.

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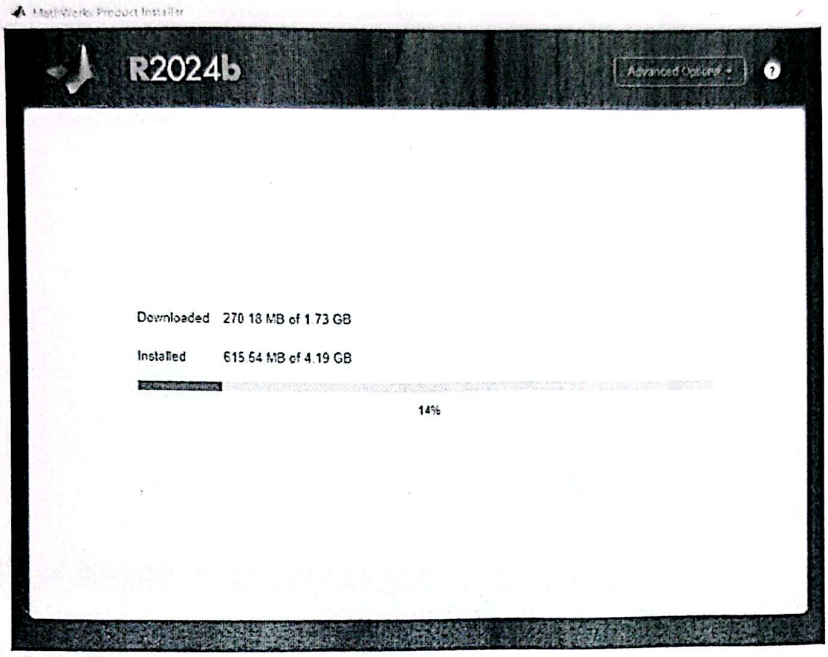
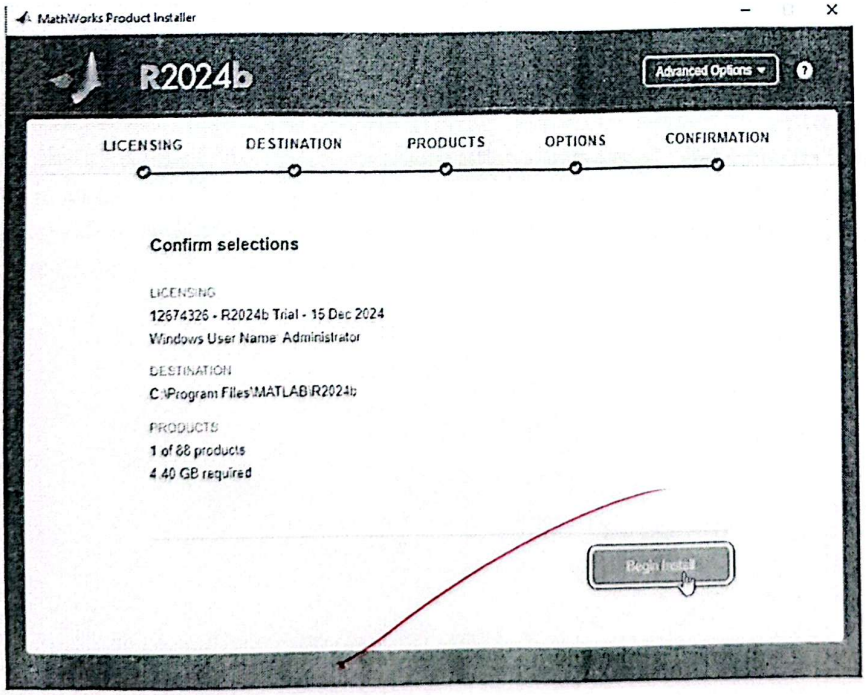


Step 6: Verifying Installation

- After installation, launched MATLAB.
- Verified the version, toolboxes, and successful activation by running ver command in the Command Window.



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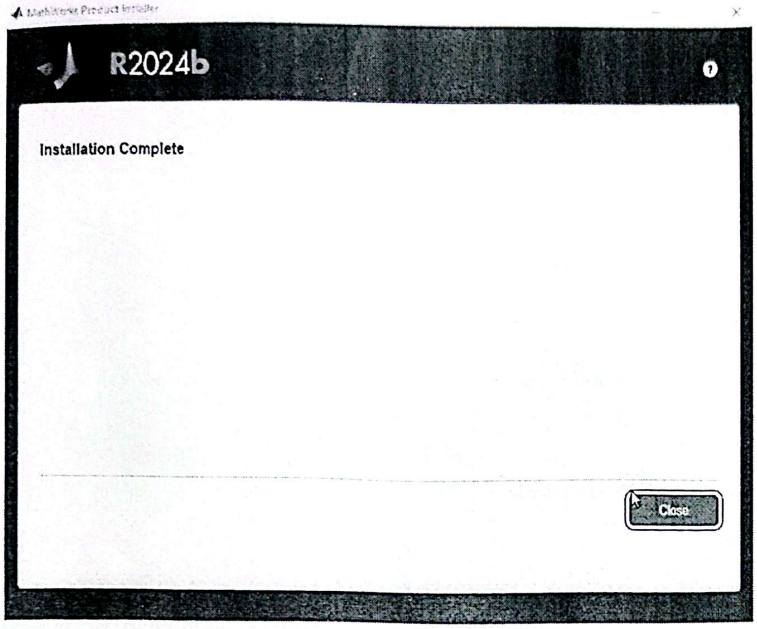

Observations:

- The installation process was straightforward but time-consuming.
- All selected toolboxes installed successfully.
- MATLAB launched without errors.
- Activation was successful with the student license.
- Sample code executed without issues.

Conclusion:

The installation of MATLAB was successfully completed. The software is now ready for use in coursework and technical computations. Familiarity with the installation process ensures that students can independently install and manage their MATLAB environments in the future.

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MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

SANTOSH, TANGAIL-1902

DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY

Course Title: Data Communication Lab

Course Code: ICT-3102

Experiment Name: Signal Generation and Plotting in MATLAB 1

Lab Report No: 02

Submitted By	Submitted To
Name: Kuldip Saha Mugdha ID: IT-22018 3rd Year, 1st Semester Session: 2021-2022 Dept. of ICT, MBSTU	Dr. Md. Abir Hossain Associate Professor DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

28/5/25

Date of Performance: 21/05/2025

Date of Submission: 28/05/25

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Lab Report NO: 02

Experiment name: Signal generation and plotting in MATLAB 1.

Objective:

The objective of this lab is to generate and analyze sinusoidal and cosine waveforms using MATLAB. The specific signals under consideration are:

1. $A \sin(2\pi f t)$
2. $A \cos(2\pi f t)$
3. $A \cos(2\pi f t + \theta)$
4. a) $A \sin(2\pi f t)$
   b) $A \cos(2\pi f t)$

These expressions are fundamental in signal processing and communications. MATLAB is used to plot one compare these signals visually.

Introduction:

Sinusoidal signals such as sine and cosine functions are the foundation of many engineering applications including communications, control systems, and signal processing. MATLAB provides a powerful environment for generating, manipulating, and visualizing such signals.

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This lab involves are fundamental in signal of key parameters - amplitude (A), frequency (f), phase (θ), and time (t) - and the generation of the corresponding waveforms using MATLAB.

Materials Required:

- MATLAB software R2024a
- Computer system with windows
- Basic knowledge of MATLAB scripting

MATLAB Code and Procedure:

Signal 1: $A\sin(2\pi ft)$

```
frequency = 2; % Hz
amplitude = 3;
duration = 4; % seconds
samplingRate = 10; % Samples per second

% Create the time vector
t = 0:1/samplingRate:duration;

% Create the signal

y = amplitude * sin(2*pi*frequency*t);
% Plot signal
plot(t, y);
xlabel("Time (s)");
ylabel("Amplitude");
title('Simple Sinusoidal Signal (Kuldip)');
```

Signal 2 : $A \cos(2\pi f t)$

```
frequency = 2; % Hz
amplitude = 3;
duration = 4; % seconds
SamplingRate = 100; % sample per second
% create the time vector
t = 0:1/SamplingRate:duration;
% create the signal
y = amplitude * cos(2 * pi * frequency * t);
plot(t, y);
xlabel('Time (s)');
ylabel('Amplitude');
title('Simple Sinusoidal Signal (kaldip)');
```

Signal 3 : $A \cos(2\pi f t + \theta)$

```
frequency = 2;
amplitude = 3;
duration = 4;
SamplingRate = 100;
theta = Pi;
t = 0:1/samplingRate:duration;

y = amplitude * cos(2 * Pi * frequency * t + theta);

plot(t, y);
xlabel('Time (s)');
ylabel('Amplitude');

title('Simple cosine signal with theta (kaldip)');
```

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Signal 4: a) $A\sin(2\pi ft)$, b) $A\cos(2\pi ft)$

```
frequency = 2;
amplitude = 3;
duration = 4;
samplingRate = 100;
t = 0:1/samplingRate:duration;
y1 = amplitude * sin(2 * pi * frequency * t);
y2 = amplitude * cos(2 * pi * frequency * t);
plot(t, y1);
hold on;
plot(t, y2);
xlabel('Time (s)');
ylabel('Amplitude');
title('Sine cosine combined signal (kuldip)');
```

Conclusion:

All four signals were successfully generated and plotted using MATLAB. This lab reinforced the understanding of basic sinusoidal functions, their graphical representations, and the effect of amplitude, frequency, and phase on wave form shape. MATLAB proved to be an efficient tool for visualizing and analyzing time-domain signals.

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