**Graphics using MATLAB**

MATLAB is capable of producing **two dimensional x-y plots** and **three-dimensional plots**, **displaying images** and even **creating and playing movies**.

1. **To plot f(t) = sin(t) for 0 ≤ t ≤ 10.**
2. Create a new script file by clicking **Home Menu 🡪New****Script**.
3. Save file as ***lab2\_1.m***
4. Type the following commands in the file.

**% To plot f(t) = sin(t)**

**clear; clc; clf;**

**t = 0 : 0.01 : 10;**

**y = sin(t);**

**plot(t,y)**

1. **To plot the function y=sin(x)/x for -4π≤ *x* ≤ *4*π.**
2. Create a new script file by clicking **Home Menu 🡪New****Script**.
3. Save file as ***lab2\_2.m***
4. Type the following commands in the file.

**% To plot y= sin(x)/x**

**clear; clc; clf;**

**t = -4\*pi: 0.01 : 4\*pi;**

**y = sin(t)./t;**

**plot(t,y)**

* Click on **Insert 🡪 X Label** from the Figure window to add the X-axis label to the graph.
* Click on **Insert 🡪 Y Label** from the Figure window to add the Y-axis label to the graph.
* Click on **Insert 🡪 Title** from the Figure window to add the title to the graph.
* Click on **Tools 🡪 View Layout Grid** from the Figure window to view the grid lines in the graph.

**3) Draw a circle of unit radius.**

1. Create a new script file by clicking **Home Menu 🡪New****Script**.
2. Save file as ***lab2\_3.m***
3. Type the following commands in the file.

**% To plot a circle**

**clear; clc; clf;**

**theta = linspace(0,2\*pi,100);**

**x = cos(theta);**

**y = sin(theta);**

**plot(x,y);**

**axis('equal');**

**title('Circle of unit radius');**

1. **Drawing multiple graphs in a Figure Window.**
2. Create a new script file by clicking **Home Menu 🡪New****Script**.
3. Save file as ***lab2\_4.m***
4. Type the following commands in the file.

**clear; clc; clf;**

**t=0:0.01 :2\*pi;**

**f1=sin(t);**

**f2=f1+(1/3)\*sin(3\*t);**

**f3=f2+(1/5)\*sin(5\*t);**

**f4=f3+(1/7)\*sin(7\*t);**

**v=[0 2\*pi -1 1];**

**subplot(221),plot(t,f1),grid,**

**axis(v);**

**xlabel('f\_1 -->');**

**ylabel('t -->');**

**subplot(222),plot(t,f2),grid,**

**axis(v);**

**xlabel('f\_2 -->');**

**ylabel('t -->');**

**subplot(223),plot(t,f3),grid,**

**axis(v);**

**xlabel('f\_3 -->');**

**ylabel('t -->');**

**subplot(224),plot(t,f4),grid,**

**axis(v);**

**xlabel('f\_4 -->');**

**ylabel('t -->');**

1. **Use plot3(x,y,z) to plot the circular helix x(t)=sin(t), y(t)=cos(t) and z(t)=t, 0≤ t ≤ 20.**
2. Create a new script file by clicking **Home Menu 🡪New****Script**.
3. Save file as ***lab2\_5.m***
4. Type the following commands in the file.

**clear; clc; clf;**

**t=0:0.001 :20;**

**x=sin(t);**

**y=cos(t);**

**z=t;**

**plot3(x,y,z);**

1. **Draw a 3D plot of sin(r)/r**
2. Create a new script file by clicking **Home Menu 🡪New****Script**.
3. Save file as ***lab2\_6.m***
4. Type the following commands in the file.

**% To plot a circle**

**clear; clc; clf;**

[**X,Y] = meshgrid ( -8 : 0.5 : 8, -8 : 0.5 : 8);**

**R = sqrt(X.^2 + Y.^2) ;**

**Z = sin(R)./R;**

**mesh(Z)**

1. Now replace the **mesh (Z)** with **surf (Z)** to plot a 3D colored surface.
2. To plot both 3D-mesh and 3D-colored surface in the same Figure window, add the following lines to the script.

**subplot (221), mesh(Z)**

**subplot (222), surf(Z)**