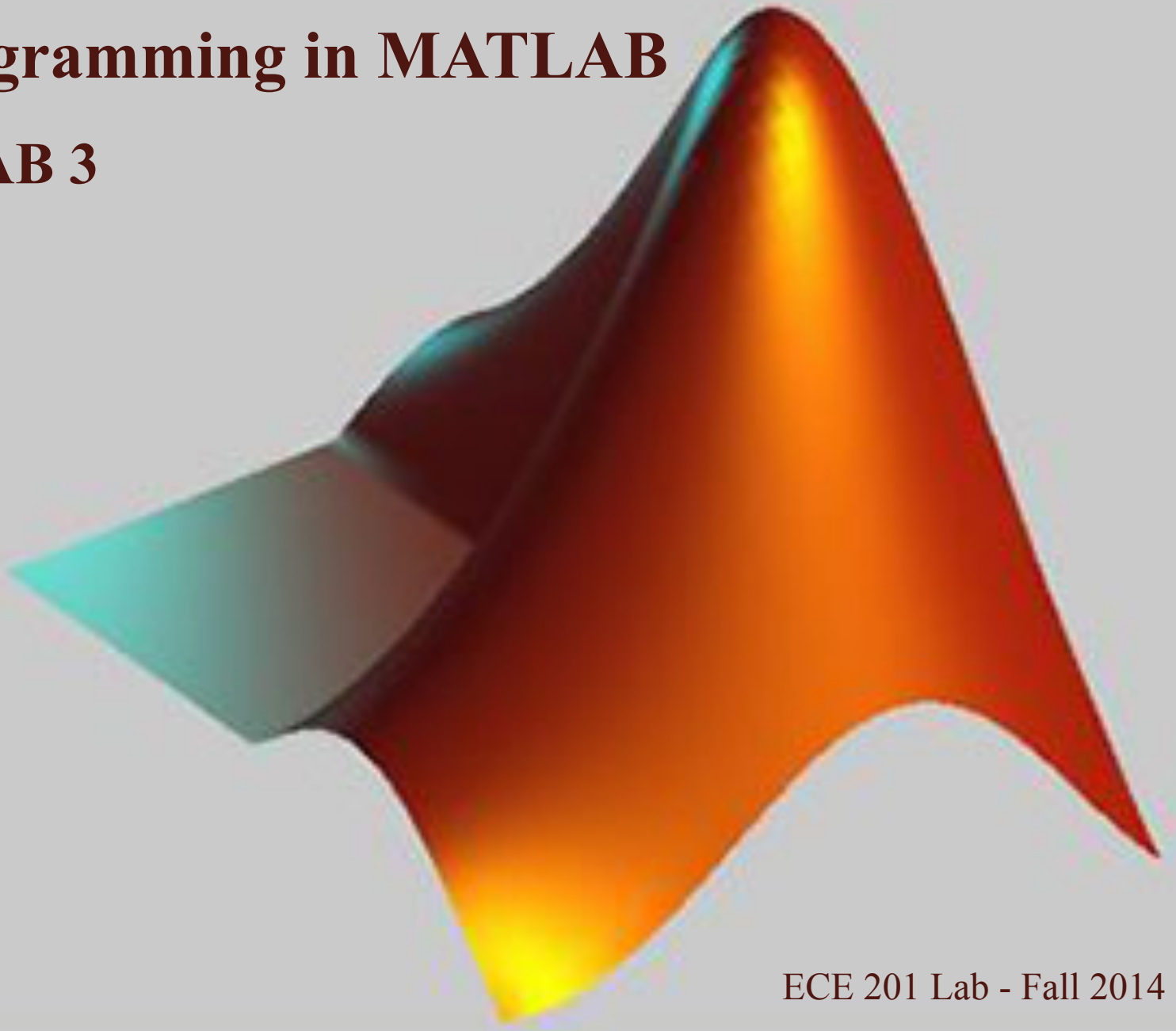
Programming in MATLAB

LAB 3



input and *disp* commands

- ***input***: asks the user for an input and stores it in a variable

```
>>  n = input ('Enter an integer number:') ;
```

- ***disp***: displays a text

```
>>  disp ( [ 'The number you entered is:' , num2str (n) ] );

>>  disp ( 'End of Program' );
```

if Statement

- ***if*** : executes statements if condition is true
- ***elseif*** : executes statement if additional condition is true
- ***else*** : executes statement if other conditions are false

```
>> if a = = b
            disp ( 'a equals b' );
   elseif  a > b
            disp ( 'a greater than b' );
   else
            disp ( 'a less than b' );
   end
```

if statement with multiple conditions

- Conditions:

```
>> if   A == B
>> if   A ~= B
>> if   A >= B
>> if   A <= B
```

- Combined conditions:

```
>> if   condition1  &&  condition2
>> if   condition1  ||  condition2
```

Loops

- ***for*** : executes a block of codes for a specified number of times

```
>> for n=1:10
       disp ( [ 'the value of n is' , num2str (n) ] );
   end
```

- ***while*** : repeatedly executes a block of codes while the condition is true

```
>> while  k < = 10
   disp (k)
   k = k + 1;
   end
```

Complex Numbers in MATLAB

- Generating complex numbers

```
>>  c1 = complex ( real_part  , im_part );
>>  c2 = real_part + i * im_part ;
>>  c3 = real_part + im_part  i ;
```

- Complex math:

```
>>  R = real (X);
>>  I = imag (X);
```

- Other commands – type help complex and look at the related commands.

Plotting complex numbers

- Plot command

  >> plot (z1 , ‘rs’); -plots the point with a red square

  - MATLAB plots the complex numbers in the complex plane
  - Real part is displayed on the horizontal axis and imaginary part on the vertical axis

Working with .mat files

- Save variables in the workspace to a .mat file

  - Saving the entire workspace

    ```
    >> save filename.mat
    ```

  - Saving some of the variables

    ```
    >> save filename.mat x y z
    ```

- Load variables from .mat file to the workspace

  - Loading all the contents of the file to the workspace

    ```
    >> load filename.mat
    >> load filename.mat x y z
    ```

Example

```
>>  a = 9 +  2i ;
>>  r = real(a) ;
>> while   r > 3
        r = r – 1 ;
    end
>>  b = r +  i * ( imag(a) * 3 ) ;
>>  if  imag(b) < 7  &&  real(b) = = 3
    disp([ 'b =', num2str(real(b)) , '+  i *' , num2str(imag(b)) ]);
    end
```