



EP375 Computational Physics

Topic 0

THE COURSE & INSTALLING MATLAB



Department of
Engineering Physics

University of Gaziantep

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Content

- **Introduction**
- **The Course**
- **Computer Programming**
- **MATLAB Installation**
- **A Very Basic MATLAB Tutorial**

Introduction

- ***Computer programming*** and numerical methods are an essential part of the work of many scientists and engineers.
- The course attempts to place emphasis on numerical methods.
- We will learn **MATLAB** Programming Language at basic level
 - ***MATLAB is a high-level computer language for scientific computing and data visualization built around an interactive programming environment.***

The Course

- **Course web page**

<http://www.gantep.edu.tr/~bingul/ep375>

- **Also search *Google* and *Wikipedia* for any of the expressions used in this course.**

Course Content

- Introduction to MATLAB
- Systems of Linear Algebraic Equations
- Numerical Differentiation
- Numerical Integration
- Roots of Equations
- Optimization
- Interpolation and Curve Fitting
- Fourier Analysis
- Sound Card Applications

Lectures, Labs, Attendance, Exams

FIRST EDUCATION

- **Tuesdays**

three-hour lecture

13:30-16:30 Engineering of Physics Seminar Room

- **Attendance**

You must attend at least 70% of the course

- **Exams**

➤ 1st midterm	30%	Project report
➤ 2nd midterm	30%	Project report
➤ Final	40%	Written Exam / Project report

Grading

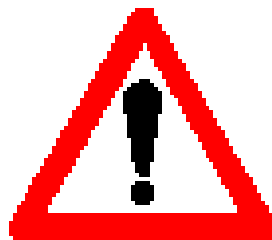
FIRST & SECOND EDUCATION

Independent from the arithmetic mean of the class, the following rules will be applied for each student:

- 00-19 -> **FF**
- 20-29 -> **FD**
- 30-39 -> **DD**
- 40-49 -> **DC**
- 50-59 -> **CC**
- 60-66 -> **CB**
- 67-75 -> **BB**
- 75-84 -> **BA**
- 85-99 -> **AA**

Computer Labs

- We'll use MATLAB under Windows operating system
- Every week you should write a few programs yourself in the lab (and more in your free time).
- So you may need to save them on a flash drive or on the internet.



**DO NOT FORGET TO BRING
YOUR LAPTOP or FLASH DISK WITH YOU**

MATLAB®

The Language of Technical Computing

Version 7.0.0.19920 (R14)

May 06, 2004

License Number: 0

Ahmet

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Copyright 1984–2004, The MathWorks, Inc.

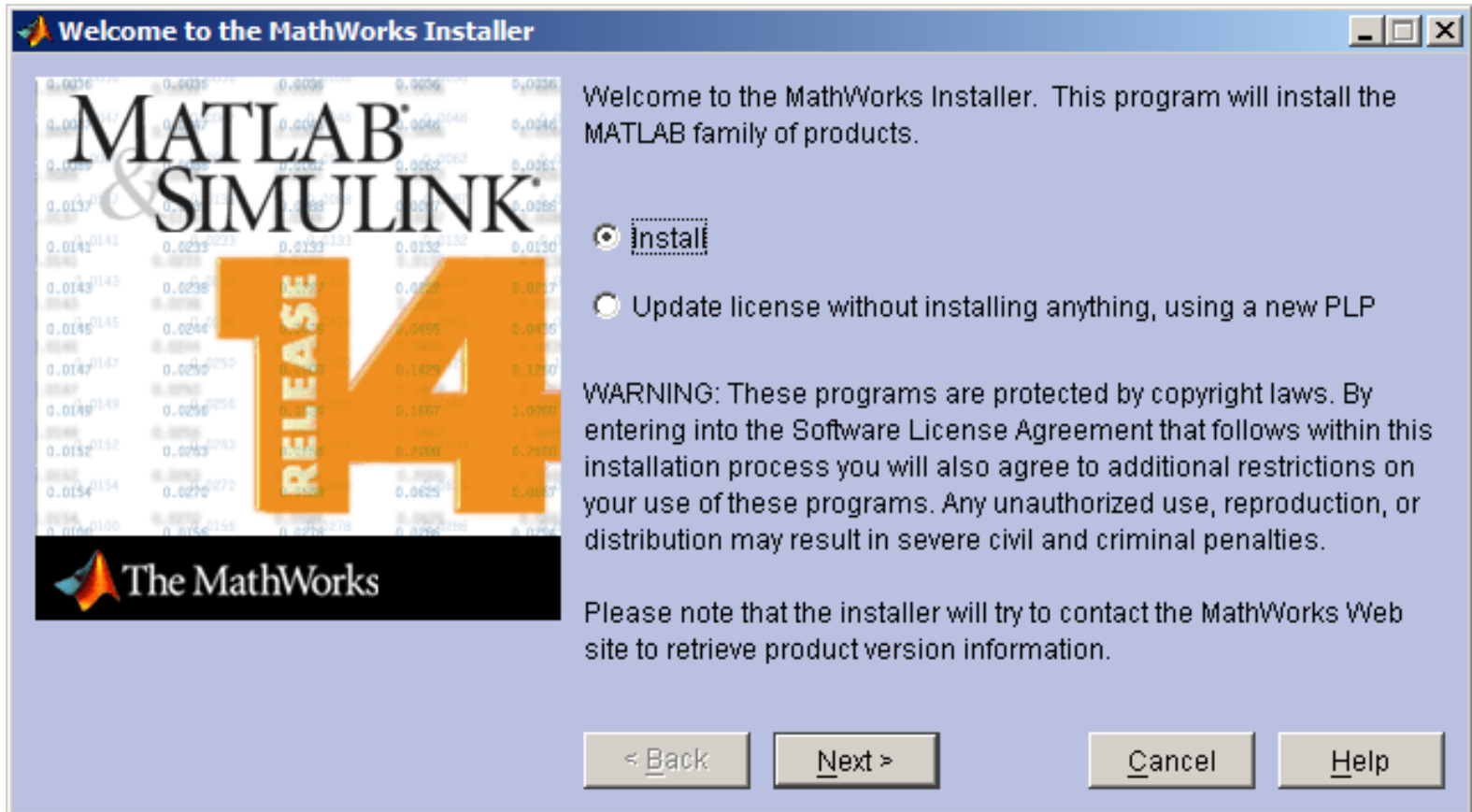
What is MATLAB?

See <http://en.wikipedia.org/wiki/MATLAB>

- MATLAB is a high-performance language for technical computing.
- It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation.

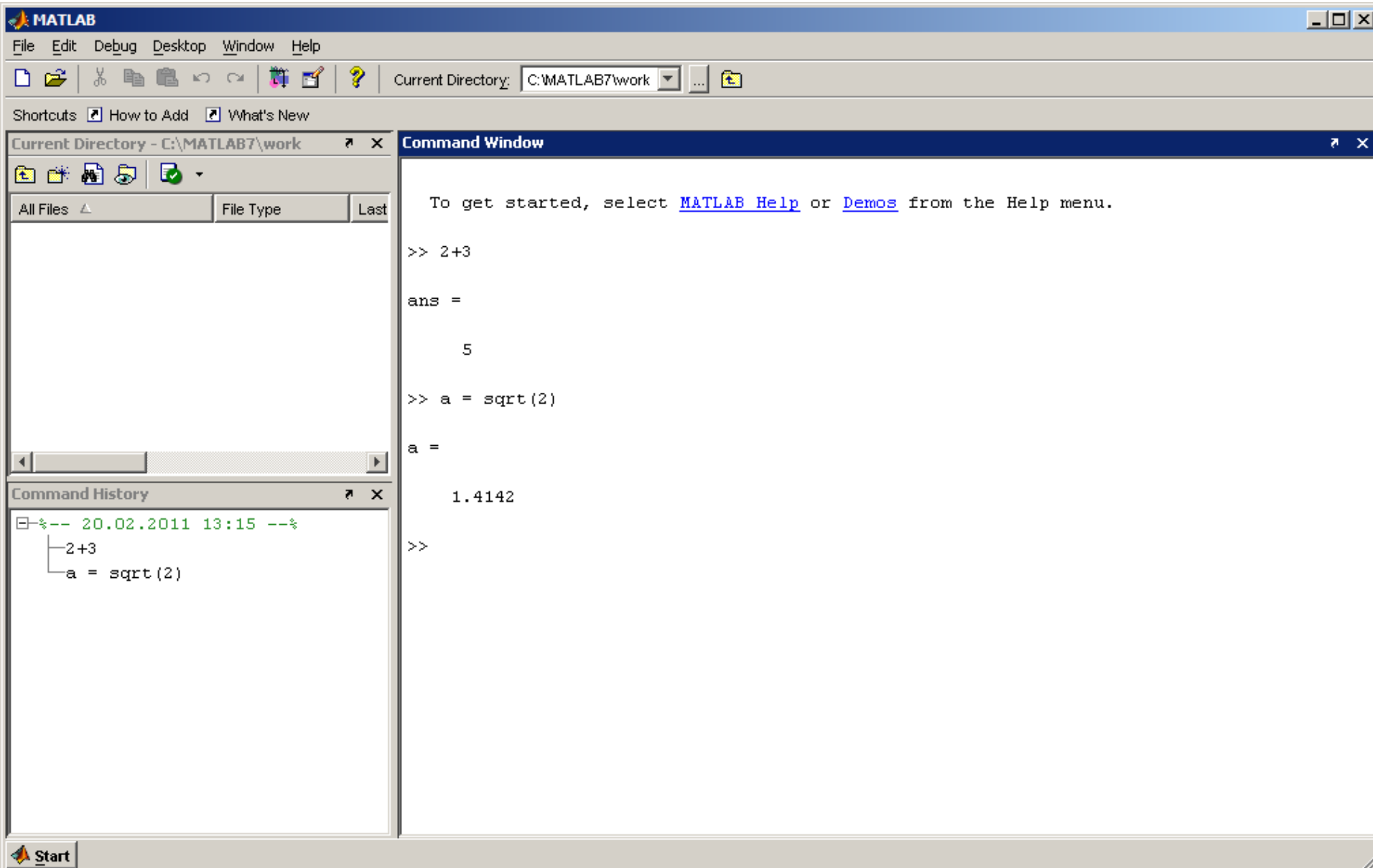
- Typical uses include
 - Math and computation
 - Algorithm development
 - Data acquisition Modeling,
 - simulation, and prototyping
 - Data analysis,
 - Scientific and engineering graphics
 - ...

MATLAB 7 Installation



Follow the instructions ...

MATLAB 7 Run



The image shows the MATLAB 7.0.1.0 software interface. The main window is titled "MATLAB" and has a menu bar with "File", "Edit", "Debug", "Desktop", "Window", and "Help". Below the menu bar is a toolbar with various icons for file operations and a "Current Directory" field set to "C:\MATLAB7\work".

The interface is divided into several panes:

- Current Directory - C:\MATLAB7\work**: A file explorer pane showing the current directory. It has a toolbar with icons for file operations and a "File Type" dropdown menu.
- Command Window**: A text area where MATLAB commands are entered and their results are displayed. The text in the window is:

```
To get started, select MATLAB Help or Demos from the Help menu.  
  
>> 2+3  
  
ans =  
  
5  
  
>> a = sqrt(2)  
  
a =  
  
1.4142  
  
>>
```
- Command History**: A list of commands entered in the Command Window. The history shows:

```
20.02.2011 13:15 --%  
├─ 2+3  
└─ a = sqrt(2)
```

The Windows taskbar is visible at the bottom, showing the "Start" button.

References

- [1]. <http://www.mathworks.com/products/matlab>
- [2]. Numerical Methods in Engineering with MATLAB,
J. Kiusalaas, Cambridge University Press (2005)
- [3]. Numerical Methods for Engineers, 6th Ed.
S.C. Chapra, Mc Graw Hill (2010)