

## Textbook

<https://drive.google.com/file/d/1sAlsYNJ6ueUFM-278soNuJBmyBvsohbZ/view?usp=sharing>

[ALL EXAMPLES IN THE BOOK PAGE MARKED AND THE PROVIDED LINKS SHOULD BE DONE]

## Lecture 1

[https://math.libretexts.org/Workbench/Numerical\\_Methods\\_with\\_Applications\\_\(Kaw\)/1%3A\\_Introduction/1.01%3A\\_Introduction\\_to\\_Numerical\\_Methods](https://math.libretexts.org/Workbench/Numerical_Methods_with_Applications_(Kaw)/1%3A_Introduction/1.01%3A_Introduction_to_Numerical_Methods)

## Lecture 2

<https://drive.google.com/file/d/1CK-KyrRlo7eFT4aVTAv4GAhpJ8B9ZxYe/view?usp=sharing>

**Textbook: PAGE:56-62**

[The rest of the ERROR and Approximations will be covered later]

## Lecture 3

### Bisection Method

<https://drive.google.com/file/d/1c5pYbnealNfcBrMMaHsnFiE3piDgan7v/view?usp=sharing>

### **Example**

<https://atozmath.com/example/CONM/Bisection.aspx?q=bi&q1=E1>

## Lecture 4,5

### Newton Raphson Method

**Textbook: Page 151-156 (Section 6.2)**

[https://drive.google.com/file/d/1\\_IJaDMeMRp6AtxS66inaRSzpXsyW6LH2/view?usp=sharing](https://drive.google.com/file/d/1_IJaDMeMRp6AtxS66inaRSzpXsyW6LH2/view?usp=sharing)

<https://drive.google.com/file/d/1TBw5Rrm-V41owQTuOZeXrcJN7N89JH0u/view?usp=sharing>

### **Example:**

<https://atozmath.com/example/CONM/Bisection.aspx?q=nr&q1=E1>

### Secant Method

**Textbook: Page 157-158**

[https://math.libretexts.org/Bookshelves/Calculus/CLP-1\\_Differential\\_Calculus\\_\(Feldman\\_Rechner and Yeager\)/06%3A\\_Appendix/6.03%3A\\_C-Root\\_Finding/6.3.04%3A\\_C.4\\_The\\_secant\\_method](https://math.libretexts.org/Bookshelves/Calculus/CLP-1_Differential_Calculus_(Feldman_Rechner_and_Yeager)/06%3A_Appendix/6.03%3A_C-Root_Finding/6.3.04%3A_C.4_The_secant_method)

### **Example**

<https://atozmath.com/example/CONM/Bisection.aspx?q=se&q1=E1>

### **CLASS RECORDING**

[https://drive.google.com/file/d/1WFbb6ogkiV1G1wUYNSWrkNO1esk7QX\\_b/view?usp=sharing](https://drive.google.com/file/d/1WFbb6ogkiV1G1wUYNSWrkNO1esk7QX_b/view?usp=sharing)

## **Lecture 6,7**

### **False Position Method**

Section 6.1 (page 135-139)

### **Fixed Iteration Method**

Section 5.3 (pages 146-147)

**EXERCISE: 5.1, 5.3 [Page 142]**

### **Examples:**

<https://atozmath.com/example/CONM/Bisection.aspx?q=it&q1=E1>

<https://atozmath.com/example/CONM/Bisection.aspx?q=fp&q1=E1>

## **Lecture 8**

### **Curve fitting - part 1 [least Square Regression]**

<https://drive.google.com/file/d/12FK4tZ9NcSA5wNIH9nT22muQchzIKE9Q/view?usp=sharing>

### **Textbook**

Page: 441-443

Page: 455- 464 (section 17.1)

<https://www.youtube.com/watch?v=ZtGkSQPLSK0>

[https://www.youtube.com/watch?v=Fg2PgHC\\_D3Q](https://www.youtube.com/watch?v=Fg2PgHC_D3Q)

**Class recording:**

<https://drive.google.com/file/d/1DPVtjmBR9u9bin2RSjXkqiQePlq3R6ny/view?usp=sharing>

**Examples (only the linear regression part):**

[https://www.uobabylon.edu.iq/eprints/publication\\_6\\_22943\\_553.pdf](https://www.uobabylon.edu.iq/eprints/publication_6_22943_553.pdf)

## **Lecture 9,10**

### **Curve fitting - part 2 [Linear Interpolation]**

**Textbook**

**Page: 490-497 [Section 18.1]**

<https://atozmath.com/example/CONM/NumelInterPola.aspx?q=DD&q1=E1>

<https://atozmath.com/example/CONM/NumelInterPola.aspx?q=DD&q1=E2>

<https://atozmath.com/example/CONM/NumelInterPola.aspx?q=DD&q1=E3>

<https://atozmath.com/example/CONM/NumelInterPola.aspx?q=DD&q1=E4>

## **Lecture 11**

### **Curve fitting - part 3 [Lagrange Interpolation]**

**Textbook**

**Page: 502-504 [Section 18.2]**

<https://www.youtube.com/watch?v=nvkX1Bd90Gk>

<https://www.youtube.com/watch?v=dcHPhLDWmZE>

**CLASS Recording:**

[https://drive.google.com/file/d/1ajLhK28Hogx2S3khrz\\_DkPz1TzUoPN7s/view?usp=sharing](https://drive.google.com/file/d/1ajLhK28Hogx2S3khrz_DkPz1TzUoPN7s/view?usp=sharing)

**EXERCISE: 18.5, 18.6 [page 524]**

## **Lectures 12 and 13**

### **Curve fitting - part 4 [ Spline Interpolation]**

Textbook

Page: 511- 520 [Section 18.6]

[https://math.libretexts.org/Workbench/Numerical\\_Methods\\_with\\_Applications\\_\(Kaw\)/5%3A\\_Interpolation/5.05%3A\\_Spline\\_Method\\_of\\_Interpolation](https://math.libretexts.org/Workbench/Numerical_Methods_with_Applications_(Kaw)/5%3A_Interpolation/5.05%3A_Spline_Method_of_Interpolation)

## **Lecture 14**

### **Truncation error and Taylor series**

Textbook

Page: 81-88 [Section 4.1]

## **Lecture 15**

### **Eular Method**

Textbook

Page: 709 - 712 [Section 25.1]

<https://tutorial.math.lamar.edu/classes/de/eulersmethod.aspx>

<https://www.youtube.com/watch?v= 0mvWedqW7c>

<https://www.youtube.com/watch?v=PwuZ3nir7d4&t=557s>

**Class Recording:**

<https://drive.google.com/file/d/11AGEiuaZXRS0PZmKNAiCxWCBT83dvTjn/view?usp=sharing>

## **Lecture 16**

### **Improved Euler Method**

Textbook

Page: 721 - 726 [Section 25.2]

## **Lecture 17**

### **Runge Kutta Method - part 1**

Textbook

Page: 729 - 734 [Section 25.3]

## **Lecture 18**

### **Runge Kutta Method - part 2**

Textbook

Page: 734 - 738 [Section 25.3]

### **Why Runge Kutta Methods are Good**

[https://drive.google.com/file/d/1\\_13KwZfr1oCp6HPVfHDNI2i2sopIFD\\_3/view?usp=sharing](https://drive.google.com/file/d/1_13KwZfr1oCp6HPVfHDNI2i2sopIFD_3/view?usp=sharing)

**EXERCISE: 25.1, 25.4 [PAGE 752]**