



Palestine Technical University – Kadoorie
Department of Applied Mathematics
Engineering Mathematics2 Syllabus
Second Semester 2016/2017

Textbook:

Advanced Engineering Mathematics, by Erwin Kreyszing, 9th edition.

References:

1. *Elementary Differential Equation and Boundary Value problems, by William E. Boyce and Richard C. Dippima.*
2. *Thomas Finney: Calculus and analytic Geometry. 11th Edition, Addison Wesley, 2011*
3. *Fourier Series, by Geogrip, Tolstov*

Instructor: Dr. Ata Asa'd

Dr. Basher Abdulla

Mrs. Kifaia Aiash

Grading: Two midterm exams (60%).

Final exam (40%).

Chapter 1: Complex Number and Higher order of linear Equation.

- 1.1 The complex number and plane
- 1.2 Euler's formula for complex number, product, and quotients
- 1.3 De Moivre's theorem and roots of complex numbers.
- 1.4 General theory of n^{th} order linear equation
- 1.5 Homogeneous equation with constant coefficients.
- 1.6 The method of undetermined coefficients.
- 1.7 The method of variation of parameters

Chapter 2: Series Solutions Of Second Order Linear Equations

- 2.1 Review of power Series.
- 2.2 Series Solution near an Ordinary point, part I
- 2.3 Series Solution near an Ordinary point, part II
- 2.4 Regular Singular point.
- 2.5 Euler Equation.
- 2.6 Series Solution near a regular singular point, part I

Chapter 3: The Laplace Transform

- 3.1 Definition of Laplace transform.
- 3.2 Solution of initial Value Problems.
- 3.3 Step Functions.
- 3.4 Differential Equation with discontinuous forcing function.
- 3.5 Impulse functions.
- 3.6 The convolution integral.



Chapter 4: Systems of First Order Linear Equations.

- 5.1 Basic Theory of Systems of First Order Linear Equations
- 5.2 Homogeneous Linear Systems with Constant Coefficients
- 5.3 Complex Eigenvalues
- 5.4 Repeated Eigenvalues
- 5.5 Nonhomogeneous Linear Systems

Chapter 5: Trigonometric Fourier Series.

- 4.1 Periodic and harmonics function.
- 4.2 Trigonometric polynomials and series of function, the orthogonality of sine and cosine
- 4.3 Fourier series of Function of period 2π and Fourier series of Function defined on an interval of length 2π .
- 4.4 Smooth and piecewise smooth function, a criterion for convergence of Fourier series
- 4.5 Even and odd function, cosine and sine series
- 4.6 The complex form of Fourier series .
- 4.7 Function of period $2l$.