**University of Anbar** 

**Engineering College** 

**Department of Mechanical Engineering** 



## ME 3301 - Engineering Analysis (3-3-1-0)

## **Third Stage**



Prepared by: Dr. Khaldoon F. Brethee

Reference: Dennis G. Zill, Warren S. Wright, (2012)-Advanced Engineering Mathematics

## **Course Topics**

- 1. Introduction to Differential Equations
- 2. Modeling with Higher Order Linear Differential Equations.
- 3. Systems of Differential Equations.
- 4. Applications of Ordinary Differential Equations.
- 5. Fourier series
- 6. Partial Differential Equations.
- 7. Functions of complex variables

## **Course Learning Outcomes:**

By the end of successful completion of this course, the student will be able to:

- 1. Think logically and mathematically for solving practical problems such as mechanical vibrations, fluid flow problems, heat transfer problems.
- 2. Practice modeling and be able to translate engineering and physical situations into a mathematical model
- 3. To gain experience and further mastery of complete problem, solving fluency based on Fourier Series and Partial Differential Equations.
- 4. Use proper assumptions to describe the complex behaviour of practical problems and able to read and interpret problem objectives.
- 5. Realize modelling with partial differential equations and Fourier analysis for solving various practical applications