

## **Course Details**

**Ostim Technical University** 

Spring 2021 MATH202 **Differential Equations** 

Lecturer Dr. Sühan Mergen suhan.mergen@ostimteknik.edu.tr

### **Course Textbook**

Kreyszig, E. (2009). Advanced Engineering Mathematics

#### Lecturing Hours (Online)

Tuesdays 15:00 to 17:00 Thursdays 14:00 to 16:00

## **Course Outcomes**

Understand the differential equation concept.

Learning the types of differential equation.

Be able to formulate mathematical models for engineering problems.

Be able to determine the particular and general solutions of the first and second-order differential equations.

Be able to solve the differential equations with Laplace transform.

#### Assessment

Spring 2021 | MATH202 -

Dr.Mergen -

2021 | MATH202 – Dr.Mergen – Spring 2021 | MATH202 -

MATH202 - Dr.Mergen - Spring 2021 | MATH202 - Dr.Mergen - Spring

Attendance	5%
Quizzes (3)	15%
Midterms (2)	40%
Final	40%

## **Topics Covered**

(Chapter number chosen so that as they appear in the textbook.)

CH 01-01: Basic Concepts and Modeling **CH 01-03:** Separable ODEs CH 01-04: Exact Differential Equations CH 01-05: Linear ODEs CH 01-07: Existence and Uniqueness of Solutions for Initial Value Problems CH 02-01: Homogeneous Linear ODEs of 2<sup>nd</sup> Order

#### First Midterm 20%

(Week 7 or 8, CH 01-01 through 02-01)

CH 02-02: Homogeneous Linear ODEs with Constant Coefficients CH 02-04: Modeling of Free Oscillations of a Mass–Spring System CH 02-06: Existence and Uniqueness of Solutions. Wronskian CH 02-07: Nonhomogeneous ODEs

# Second Midterm 20%

(Week 11 or 12, CH 02-02 through 02-07)

CH 06-01: Laplace Transform. Linearity. CH 06-02: First Shifting Theorem (s-Shifting) Transforms of Derivatives and Integrals. **ODEs** CH 06-03: Unit Step Function (Heaviside Function). Second Shifting Theorem (t-Shifting) CH 06-04: Short Impulses. Dirac's Delta Function. Partial Fractions CH 06-05: Convolution. Integral Equations

**Final Examination %40** (Covers all topics!)