

# MATH 204

## Differential Equations

### Syllabus

- **Instructor:** Dr. Shayea Aldossari.
- **Contact:** e-mail: shaaldossari@ksu.edu.sa.
- **Office Hours:** Monday and Wednesday from 10:00am-12:00pm, or by appointment.
- **Texts:** Differential Equations by Prof. Dr. Said Mesloub, Prof. Dr. Damlakhi Mostafa, and Dr. Khawaja Zafar Elahi.

Alternative reference: Differential equations with boundary value problems: by Dennis G. Zill and Michael R Cullen (Seventh or sixth edition)

- **Coures Contents:**
  - Definition of a Differential equation, Classification of Differential equations, type of solutions.
  - Initial value problems. Existence and uniqueness theorem, separable equations (Separable variables).
  - Equations with homogeneous coefficients, Exact Equations
  - Integrating factors, general form of a linear equation and Equations with linear coefficients
  - Bernoulli equation.
  - Applications, Linear Models: Orthogonal trajectories, Growth and decay, Newton's Law of Cooling.
  - Higher order Differential equations. Linear Differential equations: Existence-Uniqueness Theorem, Linearly (independent solutions, dependent solutions), Wronskian, Method of Reduction of order.
  - Homogeneous linear Differential equations with constant coefficients. Undetermined coefficient method.
  - Cauchy-Euler Equation, Variation of parameters.
  - Solving systems of Linear Equations by Elimination Method.

- Series solutions of Linear Equations.
  - Orthogonal Functions and Fourier series.
  - Fourier cosine and sine series, Complex Fourier series.
  - Fourier Integral. Complex form of Fourier integral
- **Attendance Policy:** Students are expected to attend every class, to arrive on time, and to participate in all class activities. You are responsible for material covered if you are absent. If you miss 25% of the class meetings, your grade will be DN (Denied).
  - **Exams and Grading Policy:**
    - Two Quizzes each one worth 10 points.
    - Midterm: 30 points.
    - Final Exam: 40 points. In class on 20/01/1444.
    - 10 points for the TA.

Final grade will be calculated in the following way:  $100 - 95 = A+$ ,  
 $> 95 - 90 = A$ ,  $> 90 - 85 = B+$ ,  $> 85 - 80 = B$ ,  $> 80 - 75 = C+$ ,  
 $> 75 - 70 = C$ ,  $> 70 - 65 = D+$ ,  $> 65 - 60 = D$ , and  $> 60 = F$ .