

# Mathematics of Physics and Engineering I

MATH 245

Fall 2022

12:00 – 12:50

KAP 414

**COURSE TO BE TAUGHT ON LINE**

**Text:** “Differential Equations, 2<sup>nd</sup> ed.” by Polking, Boggess and Arnold

The topics covered in the course will include:

1. Introduction- Models resulting in ODE
2. First Order Differential Equations.
3. Second Order Differential Equations
4. Second Order Linear Equations-Constant Coefficients
5. The Laplace Transform
6. Linear Algebra, Matrices
7. Systems of First Order Linear Equations
8. Systems ... Constant Coefficients- Eigenvalues
9. Nonlinear Differential Equations and Stability

**Instructor:** Robert Sacker

**Office:** KAP 438-A\*, (213)740-3793

\* It's best to contact me by email to setup a Zoom meeting

**E-mail:** rsacker@usc.edu

**Course credit:** 4 units

**Teaching Assistant** Abdullah Karakus <karakus@usc.edu>

**Grader** Yahir Garcia <yogarcia@usc.edu>

Midterm Exam 1:	Wednesday	September 21	
Midterm Exam 2:	Wednesday	November 2	
Final	Friday	December 9	11:00 AM to 1

## Grading Distribution

2 Midterm exams – 40% of grade

Quizzes –20%

Homework – 20%

Final – 20%

	<b>Class</b>	<b>Schedule</b>
<b>Week</b>	<b>Sections covered*</b>	
1	2.1–2.4 + parts of 1.1 & 1.3	see next page
2	2.5, 2.6, 4.3, 4.4 + part of 4,1	see next page
3	4.5, 4.6	
4	4.7, 5.1,	
5	5.2, 5.3	
6	5.4, 5.5	
7	5.6, 5.7	
8	7.3, 7.4, 7.6	
9	7.7, 8.1, 8.4	
10	9.1, 9.2	
11	9.3	
12	9.5	
13	9.6, 9.9	
14	10.1, 10.6	

\* This is approximate and may vary according to holidays and need for extra time and exams

In 1.1, first section (Mechanics) only

In 1.3, last section (Motion of Ball only)

This discussion of mechanics is completed  
In Sec.2.3 (Air Resistance)

In Sec. 4.1 the section on Structure of General  
Solution (Wronskian)

6.4 1, 3, 7

6.5 2, 4

7.1 2a, 4a, 14a

7.2 6abc, 19abc

7.4 1abc

\* Homework is assigned automatically once a section is covered