Date	**2015-16**	**Credits**	**6 credits**
Course Title	**Differential Equations**	**Course Number**	**MAT371**
Pre-requisite (s)	**MAT113 Calculus I, MAT221 Linear Algebra I**	**Co-requisite (s)**	
Hours	**42 hours**	**Out Of Class Work Hours**	**42 Hours**

Place and Time of Class Meeting

Tuesdays 14:00-16:00, room D107
Wednesdays 11:00-12:00, room D107

Name and Contact Information of Instructor

Dr. Neil Course
neil.course@okan.edu.tr

Book suggested

William E. Boyce and Richard C. DiPrima, **Elementary Differential Equations and Boundary Value Problems**, Wiley. (Your copy doesn't have to be latest edition. Second hand copies are acceptable.)

Eren, Şaban and Mesut Razbonyalı, **Diferansiyel Denklemler**, Maltepe Üniversitesi Yayınları.

Classroom expectations for students

Attendance Policy

Students are expected to attend greater than 70% of scheduled lectures for the courses that they are registered for and to achieve the goals set forth by each class instructor. Attendance is taken daily. It is the student's responsibility to arrange to make up work missed because of an absence. Students are expected to study approximately 1 hour outside of class for each 1 hour of lectures given.

Student Tardiness Policy

A student is considered tardy/late if he/she comes to class 15 minutes late. With three tardies the student accumulates one full absence. If the student misses half of the class period, it is a full absence. When a student has more than 3 tardies, the instructor will contact the Institution Coordinator of Student Affairs and Academic Department and request an intervention session with the student. The goal of the intervention session is to develop and implement an intervention program to help students learn new ways to save and manage time.

NOTE: Plagiarism is defined as the use, without proper acknowledgment, of the ideas, phrases, sentences, or larger units of discourse from another writer or speaker. Plagiarism includes the unauthorized copying of software and the violation of copyright laws. Students who commit plagiarism will obtain a grade of “Failure” on their exam or assignment.

Course Description (must correspond exactly to Catalog description)

This course is designated to provide a basic introduction to the area of mathematics described by the course title. In particular, students will study: first order equations and various applications. Higher order linear differential equations, the Laplace transform, solution of initial value problems, systems of linear differential equations.

Learning Objectives

At the end of this course students will be able:

- To understand and recall the definitions of key concepts in this area of mathematics;
- To understand and recall the important results discussed;
- To apply all of the methods and techniques discussed and developed in the course;
- To provide proofs to elementary problems in this area of mathematics;

Topical Outline and Schedule

DATE	WEEK 1
SPECIFIC OBJECTIVES	• Introduction to the course
TOPIC (S)	• Syllabus • Book • Course website • Homework • Expectations • Plagiarism • Motivation • **First order differential equations**
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Obtain a copy of the textbook
DATE	**WEEK 2**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **First order differential equations** • Some Basic Mathematical Models • Direction Fields • Solutions of Some Differential Equations
LEARNING	• Lectures

ACTIVITIES	• Independent study
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book. Section numbers will not be given in this schedule due to difference between various editions, but should be immediately obvious to candidates. • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 3**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **First order differential equations** • Classification of differential equations • Linear first order differential equations
LEARNING ACTIVITIES	• Lectures • Independent study
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 4**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **First order differential equations** • Linear first order differential equations
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems

DATE	WEEK 5
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **First order differential equations** • Separable first order differential equations • A discussion of the differences between linear and non-linear first order ordinary differential equations
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 6**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **First order differential equations** • Existence and uniqueness theorems for first order linear and non-linear ordinary differential equations • Autonomous Equations and population dynamics
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 7**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **First order differential equations** • Exact first order differential equations
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems

DATE	**WEEK 8**
SPECIFIC OBJECTIVES	• Assessment
TOPIC (S)	• Midterm Exam
LEARNING ACTIVITIES	Exam
OUT OF CLASS WORK ASSIGMENT	• Revision
DATE	**WEEK 9**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **Second Order Differential Equations** • Homogeneous Equations with Constant Coefficients • Real Roots of the Characteristic Equation • Fundamental Solutions of Linear Homogeneous Equations
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 10**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **Second Order Differential Equations** • Linear Independence and the Wronskian • Complex Roots of the Characteristic Equation • Repeated Roots; Reduction of Order •
LEARNING ACTIVITIES	• Lectures • Independent study • •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems

	•
DATE	**WEEK 11**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below •
TOPIC (S)	• **Second Order Differential Equations** • Nonhomogeneous Equations • The method of Undetermined Coefficients • The method of Variation of Parameters •
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 12**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **Systems of Linear Ordinary Differential Equations** • Introduction • Review of Matrices • Systems of Linear Algebraic Equations; Linear Independence,
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 13**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **Systems of Linear Ordinary Differential Equations** • Eigenvalues, Eigenvectors • Basic Theory of Systems of First Order Linear Equations • Homogeneous Linear Systems with Constant Coefficients
LEARNING	• Lectures

ACTIVITIES	• Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems
DATE	**WEEK 14**
SPECIFIC OBJECTIVES	• Students will have developed a basic understanding of the topics listed below
TOPIC (S)	• **Systems of Linear Ordinary Differential Equations** • Homogeneous Linear Systems with Constant Coefficients • Complex Eigenvalues • Fundamental Matrices • Repeated Eigenvalues
LEARNING ACTIVITIES	• Lectures • Independent study •
OUT OF CLASS WORK ASSIGMENT	• Read relevant sections of text book • Attempt a significant number of the exercises in the text book • Read around the subject • Complete homework problems

Instructional Methods

In developing methodological strategies, it is best to discuss them between teachers and students in an environment of freedom and mutual agreement in order to ensure that the students make them their own and take responsibility for their execution and for attaining the goals of this course.

The following strategies may be used in this class:
1. A review of the literature.
2. Check of the reading.
3. Analysis of assigned readings.
4. Group discussions and implementations.
5. Individual and group discussions.
6. Preparation of homework.

Instructional Materials and References

William E. Boyce and Richard C. DiPrima, **Elementary Differential Equations and Boundary Value Problems**, Wiley.

Home study materials provided online at www.neilcourse.co.uk

Assessment Criteria and Methods of Evaluating Students

76 – 100%	→ AA
70 – 75%	→ BA
65 – 69%	→ BB
59 – 64%	→ CB
53 – 58%	→ CC
47 – 52%	→ DC
39 – 46%	→ DD
0 – 39%	→ FF

There will not be a curve!

Generally, the grades "AA" to "BB" are considered impressive grades. Grades "CB" to "DD" are considered merely passing grades.

Distribution of Grade Elements

8 pieces of homework:	25%
Midterm Exam:	25%
Final Exam:	50%
Total:	100 %

Date Syllabus Was Last Reviewed: Saturday, September 26, 2015.