



# Kırıkkale University

FACULTY OF ARTS AND SCIENCES  
MATHEMATICS

## FEF2120 Differential Equations 1

Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
3	FEF2120	Differential Equations 1	4	4	6

### Mode of Delivery:

Face to Face

### Language of Instruction:

Türkisch

### Level of Course Unit:

Bachelor's Degree

### Work Placement(s):

No

### Department / Program:

MATHEMATICS

### Type of Course Unit:

Required

### Objectives of the Course:

To gain students to be able to solving differential equations

### Teaching Methods and Techniques:

Lecture, Drilland Practice, Problem Solving.

### Prerequisites and co-requisites:

### Course Coordinator:

### Name of Lecturers:

Associate Prof.Dr. Recep ŞAHİN

### Assistants:

## Recommended or Required Reading

### Resources

ROSS, S.L, JOHN Wiley and Sons, Differential Equations, 1924.  
Lectures notes based on theory of differential equations.  
BRONSON, R., Modern Introductory Differential Equations?, Schaum?s Outline Series, 1973.

## Course Category

Mathematics and Basic Sciences	: 70	Education	:
Engineering	: 30	Science	: 100
Engineering Design	:	Health	:
Social Sciences	:	Field	:

## Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic concept, the definition of differential equation, order and degree, notation, solutions		
2	First-order differential equations ,seperable equations		
3	Homogeneous equations and equations reducible to them		
4	Linear equations of first order, the Bernoulli equations		
5	The Riccati equations, exact (total) differential equations		
6	The integrating factors		
7	Some applications of first-order equations, orthogonal and oblique trajectories		
8	Midterm		
9	Some problems in mechanics		
10	Rate problems		
11	Problems in cooling, falling bodies with air resistance		
12	First-order differential equations not solved for the derivate		
13	The equations of the form $f(x, y)=0, f(y, y')$		
14	Singular solutions, existence and uniqueness theorems		
15	Applications		

## Course Learning Outcomes

No	Learning Outcomes
C01	They learn that differential equations are the mathematical models of many events in engineering and science, and even in social sciences.
C02	They learn to create a well-defined model.
C03	Determine the solution of a well-defined problem examined in the course.

## Program Learning Outcomes

No	Learning Outcome
P09	Independently carries out research in the field of Mathematical Sciences.
P08	Uses the ability of abstract thinking.
P07	Solves numerical, algebraic, geometric and spatial expressions, equations, functions and problems.
P12	Develops new ideas in the field of Mathematical Sciences.
P11	Updates their current knowledge in the field of Mathematical Sciences.
P10	Critically evaluates the knowledge and skills acquired in the field.
P03	Advanced undergraduate subjects will have the qualifications to carry out the work independently in partnership.
P02	The fundamental notions, theories and data, evaluating scientific methods, identify and analyze problems and issues encountered in discussions, makes recommendations based on research eviden
P01	Based on efficiencies gained by using materials related to mathematics in secondary education, is equipped with advanced knowledge.
P06	Interprets abstract mathematical concepts, including rings and abstract algebra, and critical reasoning.
P05	Interprets mathematical and statistical models such as formulas, functions, graphs, tables, and schematics.
P04	Can express mathematical information numerically, symbolically, graphically, verbally, and visually.

