MAT3005		Differential Geometry 1			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MAT3005	Differential Geometry 1	4	4	7

Mode of Delivery:
Face to Face
Language of Instruction:
Türkish
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
MATHEMATICS
Type of Course Unit:
Required
Objectives of the Course:
This course?s aim is to give the fundamental concepts of the differential geometry. Also teaching Euclidean space, tangent vector, tangent space, vector field, space of vector fields, directional derivative, covariant derivative, curve, velocity vector of a curve, Serret-Frenet?s formulas, curvatures, surfaces and parameter curves on the surfaces.
Teaching Methods and Techniques:
Euclidean spaces, Differentiable functions, Tangent vector, Tangent spaces, Directional derivative, Vector fields, Derivative transformations, Curves, arc length, Derivative of a vector field along the curve, Covariant Derivative, Frenet?s vector fields, Curvature of a curve, its torsion and geometrical means, Circle of the curvature, Sphere of the curvature, Evolutes and Involutes, Bertrand curves, Surfaces, Examples of surfaces, Parameter curves on the surfaces.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Halit Gündoğan
Assistants:

Recommended or Required Reading

Resources	Hacısalihoğlu, H.Hilmi ve Sabuncuoğlu, Arif, ?Diferensiyel Geometri?, Milli Eğitim Basımevi, İstanbul, 1983.
	Sabuncuoğlu, Arif, ?Diferensiyel Geometri?, Nobel Yayınları, Ankara, 2001.
	Hacısalihoğlu, H. H., Diferensiyel Geometri, Cilt I, Ankara Üniversitesi, Fen Fakültesi Matematik Bölümü, 1994.
	Hacısalihoğlu, H. H., Diferensiyel Geometri, Cilt II, Ankara Üniversitesi, Fen Fakültesi Matematik Bölümü, 1998.
	Lecture, Drilland Practice, Problem Solving, Discussion, Question and Answer.
	Hacısalihoğlu, H. H., Çözümlü Diferensiyel Geometri Problemleri, Cilt I, Ankara Üniversitesi, Fen Fakültesi Matematik Bölümü, 1996.Hacısalihoğlu, H. H., Çözümlü Diferensi

Course Category

Mathmatics and Basic Sciences	:		Education	:	
Engineering	:		Science	:	
Engineering Design	:		Health	:	
Social Sciences	:		Field	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Euclidean spaces, Differentiable functions		
2	Tangent vector, Tangent spaces		
3	Vector fields, Directional derivative		
4	Derivative transformations		
5	Curves, arc lenght		
6	Derivative of a vector field along the curve		
7	Covariant Derivative		
8	mid term exam		
9	Frenet vector fields		
10	the curvature of curve, the torsion of curve and geometric means		
11	Circle of curvature, sphere of curvature		
12	Involutes, evolutes and bertrand curves		
13	surfaces		
14	Examples of surfaces		
15	Parameter curves on the surface		

Course Learning Outcomes

No	Learning Outcomes
C01	Tanjant vektörü, vektör alanı, yöne göre türev, kovaryant türev kavramlarını bilir.
	Eğri kavramını tanır/anlar.

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.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	16	4	64
Hours for off-the-c.r.stud	14	6	84
Assignments	3	6	18
Presentation	0	0	0
Mid-terms	1	20	20
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	30	30
Total Work Load			**216**
ECTS Credit of the Course			**7**

Contribution of Learning Outcomes to Programme Outcomes

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	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	4	4	5	5	3	4	5	4	4	5	4
C01	5	4	4	5	5	3	4	5	4	4	5	4