

Department Department of Mathematics			Academic Year 2022-2023	Date 01/12/2022	
Course Unit Code MATH3106	Course Unit Title Differential Geometry II		Semester/Year Spring / 3	Number of ECTS Credits 5	
Language of Instruction	Turkish				
Type of Course Unit	Compulsory				
Prerequisites and co-requisites	-				
Address of course	-				
Local Credit	Theoretical	Practical	Laboratory	Presentation	Project
3	2	2	-	-	-
Name of Lecturers	Associate Professor Zühal KÜÇÜKARSLAN YÜZBAŞI				
Assistants	-				

Course content	Local and global properties of surfaces. Surface examples. Distance between any two points on surface. Shape operator, Gauss map and Gaussian curvature. Ruled surfaces and surfaces of revolution. Minimal surfaces and Gauss' Theorema Egregium. Christoffel symbols and geodesics.
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Weekly Detailed Course Contents	
Week	Topic
1	Local surfaces and regular surfaces
2	Regular surfaces and examples of surfaces
3	Graph surfaces and metric on surfaces
4	Shape operator, Gauss map, and normal curvature
5	Gauss and mean curvature, third fundamental form
6	Calculation of shape operator and eigenvalues
7	Surfaces and their curvatures
8	Tangent developable surfaces and non-cylindrical ruled surfaces
9	General application
10	Surfaces of revolution, principal curves and curvatures of surfaces of revolution
11	Minimal surfaces: Normal variation, minimal surfaces and examples of minimal surfaces
12	Structural geometry of surfaces and Gauss' Theorema Egregium
13	Christoffel symbols, geodesic curvature and geodesic torsion of curves and Frenet formulas
14	A brief evaluation of the course content and topics

Course Resources	1. Diferensiyel Geometri (H. Hilmi HACISALİHOĞLU) 2. Diferensiyel Geometri (Arif SABUNCOĞLU) 3. Modern Differential Geometry of Curves and Surfaces with Mathematica (Alfred GRAY) 4. Elementary Differential Geometry (Andrew PRESSLEY) 5. Çözümlü diferensiyel geometri problemleri (H. Hilmi HACISALİHOĞLU) 6. Çözümlü diferensiyel geometri alıştırmaları (Arif SABUNCOĞLU)
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Assessment Methods and Criteria	In-Term studies	Quantity	Percentage (%)
	Mid-Term Exams	1	40
	Quizzes	-	-
	Assignments	-	-
	Projects	-	-
	Term assignment	-	-
	Laboratory	-	-
	Other	-	-

	Final exam	1	60
On Assessment Methods and Criteria	A grade of success; is determined by using the relative evaluation system or the discretion of the instructor. In order to be able to evaluate the courses in which the relative evaluation system and the teaching staff member's discretion are applied, the final exam score of the student must be at least YSAS. Students who fall below this score are considered to fail directly. For the courses that can not be evaluated with the relative evaluation system, the distribution of the final grade of the final grade and the letter grades which are the equivalents of the success grades are determined by the consent of the instructor who gives the lesson using the table prepared by the Senate with 100 points. A student who has received a grade AA, BA, BB, CB or CC grade is deemed to have completed that course. A student who has received one of the grade DC or DD grades is deemed to have fulfilled that course condition. In order for a student who takes DD and DC letters to be counted as successful, the GNO must be at least 2.00. A student who receives a graded FF grade is considered to have failed that course.		

Percentage of Course Category (%)	Mathematics and Basic Sciences	100
	Computer Sciences	0
	Programming Design	0
	Social sciences	0

Course Outcome	To calculate metric on surface and to determine shape of surface. To recognize minimal surfaces which is a key concept in variational calculus. To get a start to Riemannian geometry by learning Christoffel symbols and geodesics.
Aims of the course	<ol style="list-style-type: none"> To provide the basis relating to surfaces which are the generalizations of curves. To enrich mathematical perspective of students by doing surface visualizations via computer graphics. To lead students to explore the notions in daily life corresponding to theoretical objects.
The way of processing course	Face to face

Relation of the course with program outcomes				
Learning outcomes		1	2	3
1	To have advanced theoretical and applied knowledge in a way to prioritize the scientific approach supported by textbooks containing up-to-date information in the field, application tools and other resources			
2	Adapting and transferring the knowledge gained in the field to secondary education			
3	Ability to independently carry out an advanced study in the field		X	
4	Be aware of the necessity of lifelong learning and continuously improve their professional knowledge and skills.			X
5	Using a foreign language at least at the European Language Portfolio B1 General Level, following the information in the field and being able to communicate with colleagues			
6	To be able to use information and communication technologies together with computer software at minimum advanced level of European computer license required by the field.			
7	Have the ability to make oral and written presentation in native language		X	
8	Having the ability to understand spoken English and use English at reading level			
9	To have the ability to assimilate mathematical concepts and understand the relationships between them, to recognize different aspects of the same concepts and relationships			
10	To have the ability to define and formulate the relationships between items in non-mathematical disciplines in the language of mathematics.			
11	To have the ability to use mathematical knowledge in different problems			
12	Having the ability to develop computer programs using mathematical knowledge			
Contribution of the course: 1:No 2:Partially 3:Completely				

Preparer: Associated Professor Muhittin Evren AYDIN
Preparation date: 01/12/2022