

<b>Department</b> Department of Mathematics			<b>Academic Year</b> 2022-2023	<b>Date</b> 01/12/2022	
<b>Course Unit Code</b> MATH2104	<b>Course Unit Title</b> Calculus IV		<b>Semester/Year</b> Spring /2	<b>Number of ECTS Credits</b> 7	
<b>Language of Instruction</b>	Turkish				
<b>Type of Course Unit</b>	Compulsory				
<b>Prerequisites and co-requisites</b>	-				
<b>Address of course</b>	-				
<b>Local Credit</b>	<b>Theoretical</b>	<b>Practical</b>	<b>Laboratory</b>	<b>Presentation</b>	<b>Project</b>
5	4	2	-	-	-
<b>Name of Lecturers</b>	Professor Mikail ET				
<b>Assistants</b>	-				

<b>Course content</b>	Partial Derivation and related problems, Chain Rule, Fully Differential, Derivation of closed-Functions and related problems, Directional Derivative, Examples related to Taylor Expansion of two-Variable Functions, Maximum and Minimum problems for two-Variable Functions, Lagrange Multiplier Method , Regional Transformations, Vector Fields and related problems, Geometric Meaning of Partial Derivations, differentiation under integral sign (Leibtniz) and related problems, Double Integrals, First and Second Fubini Theorems, Regional Transformations and related problems, Applications of Double Integrals, Area, Volumes and Mass Calculation, Center of gravity and related problems, Triple Integrals and Regional Transformations, Applications of Triple Integrals and related problems, Line Integrals of Scaler and Vector fields, Main Theorems of Line Integral and Applications, Surface Integrals and Main theorems of Surface Integral Problems related to applications.
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Weekly Detailed Course Contents	
Week	Topic
1	Partial derivation and related problems
2	Chain rule, total differential, derivation of implicit functions and related problems
3	Derivative in any direction, examples related to Taylor expansion of two-variable functions
4	Maximum and minimum problems for two-variable functions
5	Lagrange multiplier method , regional transformations, vector fields and related problems
6	Geometric meaning of partial derivations, differentiation under integral sign (Leibnitz) and related problems
7	Double integrals, first and second Fubini's theorems, regional transformations and related problems
8	Applications of double integrals, area, volumes and mass calculation, center of mass and related problems
9	General application
10	Triple integrals and regional transformations
11	Applications of triple integrals and related problems
12	Line integrals of scaler and vector fields, main theorems of line integral and applications
13	Surface integrals and main theorems of surface integral problems related to applications
14	A brief evaluation of the course content and topics

<b>Course Resources</b>	1. Mathematical Analysis 2 (Mustafa Balcı) 2. Advanced Mathematics (Murray R. Spiegel)
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Assessment Methods and Criteria	In-Term studies	Quantity	Percentage (%)
	Mid-Term Exams	1	40
	Quizzes	-	-
	Assignments	-	-
	Projects	-	-
	Term assignment	-	-

	<b>Laboratory</b>	-	-
	<b>Other</b>	-	-
	<b>Final exam</b>	1	60
<b>On Assessment Methods and Criteria</b>	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.		

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

<b>Course Outcome</b>	Students have basic information about partial derivation, chain rule, maximum and minimum problems, of two-variable functions, double integrals and applications, triple integrals, line integrals and its properties, surface Integrals and its properties theoretically.
<b>Aims of the course</b>	1. To create the necessary infrastructure of the students in regard to the Calculus lesson. 2. Acquiring the technical knowledge that will be able to produce the most suitable solution to the students in problems that are related to analysis lesson and require solution.
<b>The way of processing course</b>	Face to face

<b>Relation of the course with program outcomes</b>				
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		X	
3	Ability to independently carry out an advanced study in the field			
4	Be aware of the necessity of lifelong learning and continuously improve their professional knowledge and skills.			
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			
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			X
10	To have the ability to define and formulate the relationships between items in non-mathematical disciplines in the language of mathematics.			X
11	To have the ability to use mathematical knowledge in different problems			
12	Having the ability to develop computer programs using mathematical knowledge			
<b>Contribution of the course: 1:No 2:Partially 3:Completely</b>				

**Preparer:** Professor Mikail ET  
**Preparation date:** 01/12/2022