Department of Geomatics Engineering / Faculty Of Engineering And Architecture / Department of Geomatics Engineering

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
MAT101	CALCULUS I	3.00	2.00	0.00	4.00	7.00

Course Detail

Course Language	:	English
Qualification Degree	:	Bachelor
Course Type	:	Compulsory
Preconditions	:	Not
Objectives of the Course	:	The aim of this course is to provide basic mathematical concepts for engineers.
Course Contents	:	Functions, Limits, Limits at infinity, Continuity, Rates of change, Derivative Rules, derivative of inverse functions, Trigonometric functions and their derivatives, Transcendental functions and their derivatives, Chain rule, implicit differentiation, related rates, L'Hˆopital's rule, Extreme values, concavity, asymptotes, Curve sketching, optimization, Antiderivative, definite integral, FTC,Techniques of integration: Basic Substitution rule, Integration by parts, Partial fractions, Trigonometric substitution, Improper integral
Recommended or Required Reading	:	Thomas' Calculus, Early Transcendentals, 11th Edition, Media Upgrade, 2008, Revised by M. D. Weir, J. Hass, and F. R. Giardano; Addison Wesley
Planned Learning Activities and Teaching Methods	:	Face to face and interactive education.
Recommended Optional Programme Components	:	None
Instructors	:	Dr. Öğr. Üyesi Nezihe Turhan Turan
Instructor's Assistants	:	None
Presentation Of Course	:	Face to face presentation
En Son Güncelleme Tarihi:	:	7/16/2024 5:33:53 PM

Course Outcomes

Upon the completion of this course a student :

1 will be able to describe the concepts of limit and continuity and will be able to tell the connection between them.

2 will be able to explain the concept of derivative. will be able to do applications of the derivative, including L'Hôpital's rule, modeling with related rates, calculation of extreme values of functions and sketching their graphs, and optimization problems.

3 will be able to explain the concept of integral, solves initial value problems and learns the Fundamental Theorem of Calculus.

4 will be able to learn integration techniques and be able to calculate the area under the curve by integration.

5 will be able to compute the improper integrals

Preconditions

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS

Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Limit	*Limit				
2.Week	*Continuity, Rate of change, Tangent & Normal lines and their slopes	*Continuity, Rate of change, Tangent & Normal lines and their slopes				
3.Week	*Derivative, Differentiation rules, Derivatives of trigonometric functions, Chain rule	*Derivative, Differentiation rules, Derivatives of trigonometric functions, Chain rule				
4.Week	*Implicit differentiation, Inverse functions and their derivatives, Technical derivatives regarding Exponential, Logarithmic and Inverse Trigonometric Functions	*Implicit differentiation, Inverse functions and their derivatives, Technical derivatives regarding Exponential, Logarithmic and Inverse Trigonometric Functions				
5.Week	*Applications of Derivative (L'Hopital's Rule, Related Rates)	*Applications of Derivative (L'Hopital's Rule, Related Rates)				
6.Week	*Applications of Derivative (Extreme Values and Shape of Graphs)	*Applications of Derivative (Extreme Values and Shape of Graphs)				
7.Week	*Applications of Derivative (Curve Sketching)	*Applications of Derivative (Curve Sketching)				
8.Week	*MIDTERM	*MIDTERM				
9.Week	*Applications of Derivative (Extreme Value Problems)	*Applications of Derivative (Extreme Value Problems)				
10.Week	*Antiderivative, Indefinite integrals, Integration rules, Initial Value Problems Definite integral, Fundamental Theorem of Calculus (FTC), Area Between Curves	*Antiderivative, Indefinite integrals, Integration rules, Initial Value Problems Definite integral, Fundamental Theorem of Calculus (FTC), Area Between Curves				
11.Week	*Integration Techniques (Method of Substitution, Integration by Parts)	*Integration Techniques (Method of Substitution, Integration by Parts)				
12.Week	*Integration Techniques (Partial Fractions)	*Integration Techniques (Partial Fractions)				
13.Week	*Integration Techniques (Inverse Trigonometric Substitutions)	*Integration Techniques (Inverse Trigonometric Substitutions)				
14.Week	*Improper Integrals of Type 1 & Type 2	*Improper Integrals of Type 1 & Type 2				

Assesment Methods %

1 Midterms : 50.000

2 Final : 50.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Uygulama / Pratik / Application / Practice	15	2.00	30.00
Ders Öncesi Biresysel Çalışma / Individual study before lecture	15	2.00	30.00
Ders Sonrası Biresysel Çalışma / Individual study after lecture	15	2.00	30.00
Final / Final	1	16.00	16.00
Derse Katılım / Attending lectures	15	3.00	45.00
Vize / Midterms	1	14.00	14.00
Uygulama / Pratik Sonrası Biresysel Çalışma / Individual study after Application / Practice	15	3.00	45.00
		Total :	210.00
		Sum of Workload / 30 (Hour) :	7
		ECTS :	7.00

Program And OutcomeRelation

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11
L.O. 1	5	0	0	0	0	0	0	0	0	0	0
L.O. 2	5	0	0	0	0	0	0	0	0	0	0
L.O. 3	5	0	0	0	0	0	0	0	0	0	0
L.O. 4	5	0	0	0	0	0	0	0	0	0	0
L.O. 5	5	0	0	0	0	0	0	0	0	0	0