

Global Learning Semesters

Course Syllabus

Course: MATH-190A Calculus ad Analytic Geometry I

Department: Engineering

Host Institution: University of Nicosia, Nicosia, Cyprus



Course Summary		
Course Code	Course Title	Recommended Credit Hours
MATH-190A	Calculus ad Analytic Geometry I	4
Semester Offered	Contact Hours	Prerequisites
Please contact us	42-45	MATH-160 or MPT
Department	Level of Course	Language of Instruction
Engineering	Lower Division	English

Course Description

This course introduces the student to the concept of infinitesimal calculus with both theory and applications. It also prepares the student for the continuation of calculus in the next two calculus courses (MATH-191 and MATH-270).

Prerequisites

MATH-160 or MPT

Topic Areas

1. Functions and the analysis of graphical information, properties of functions, new functions from old, mathematical models, linear models, families of functions, Inverse functions, logarithmic and exponential functions.
2. Limits and continuity (of trigonometric functions).
3. The Derivative: Tangent lines and rates of change, the definition of the derivative, techniques of differentiation, derivatives of trigonometric functions, the chain rule.
4. Implicit differentiation, derivatives of logarithmic, exponential functions and inverse trigonometric functions, indeterminate forms, L'Hopital's Rule.
5. Analysis of functions and their graphs: increasing and decreasing functions, concavity, relative extrema, first and second derivative tests.
6. Applications of the derivative: absolute maxima and minima, rectilinear motion, Newton's method, Rolle's Theorem, Mean Value Theorem.
7. Integration: Overview of the area problem, the antiderivative, definite integrals, indefinite integrals, integration by substitution, the sigma notation, the fundamental theorem of calculus, the mean value theorem of integrals, average value, logarithmic functions from the integral point of view.

Readings and Resources

Required Textbook

- Anton, Bivens and Davies, Calculus, Seventh Edition, Wiley 2002 (ISBN: 0-471-38157-8).

Recommended Readings

- Edwards and Penney, Calculus with Analytic Geometry, Fifth Edition, Prentice Hall 1998 (ISBN: 0-13-760414-9).
- Swokowski, Calculus, Sixth Edition, PWS-KENT 1994 (ISBN: 0-534-93624-5).