



Sub.	Course Description – توصيف مقرر دراسي	الموضوع	 كليات المعرفة ALMAAREFA COLLEGES
Date		التاريخ	

Course Code & No	Math 301	رياض 301	رقم المقرر ورمزه
Course Name	Calculus 3	التفاضل والتكامل 3	اسم المقرر
Credit Hours	3 (3 + 0 + 1)	(1 + 0 + 3) 3	عدد الساعات المعتمدة
Pre-requisite	Math 102	رياض 102	المتطلب السابق


General Description	توصيف عام
Calculus III is the third in the three-semester sequence in the rigorous study of calculus. It covers Sequences, Series, Integral test, estimates, and Comparison tests. Alternating series, Absolute convergence, ratio test, Strategy for testing series. Power series, Differential equations, Parametric Equations and the polar coordinate system.	المتتاليات، السلاسل، الاختبارات التكاملية، التقديرات، التقارب والتلاقي، المعادلات التفاضلية وطرق حلها، نظم المحاور القطبية.

Course Objectives
<p>Students who successfully complete this course should be able to correctly :</p> <ul style="list-style-type: none"> • Work with various algebraic and geometric aspects of vector representations to see how vectors can be combined with calculus to study motion in space and other applications. • Extend the methods of single-variable differential calculus to functions of several variables. • Generalize the notions from single-variable integral calculus to define multiple integrals, in which the integrand is a function of several variables. • Draw together ideas about differentiation, integration, and vectors to study calculus of a vector function. • Determine the convergence or divergence of sequences and series having numerical terms. • Find a power series representation for a given function and determine its domain. • Extend the operations of differentiation and integration to functions defined by a power series. • Find a polynomial, which approximates a given function to a specified degree of accuracy on a specified interval. • Learn about infinite series, power series, Taylor series, and Maclaurin series. • Understand convergence tests, limit comparison tests, and conditional convergence. • Perform differentiation and integration of power series.

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Course Outlines

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- Sequences
- Series
- Integral test, estimates
- Comparison tests
- Alternating series
- Absolute convergence, ratio test
- Strategy for testing series
- Power series
- Representing functions as power series
- Taylor series, Malaria series
- Binomial series
- Applications of Taylor polynomials
- Parametric Equations and the polar coordinate system.
- Area and arc length for parametric and polar equations.
- Vectors in two and three dimensions, lines and planes.
- Surfaces in rectangular, cylindrical, and spherical coordinates.
- Vector valued functions, velocity, acceleration, force, and work.
- Functions of several variables.
- Partial derivatives and gradients.
- Extrema and Lagrange multipliers. Linear regression.
- Integration of functions of several variables.
- Mass, centroids, centers of mass, and moments of inertia.
- Surface area.
- Line and path integrals.
- Vector fields.
- Surface integrals, Green's Theorem and the Divergence Theorem.

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- **Textbooks :**
- James Stewart. *Calculus - Early Transcendental*, 5th edition, Brooks/Cole, 2003; ISBN: 0534393217.