Course title: Differential and Integral Calculus	Course number and code: (Math201)
Previous course requirement: Math111 (Integral calculus).	Language of the course:
Course level: Level 6	Effective hours: 4 (3+2+0)

Course description   وصف المقرر :

Functions of several variables, Domains, Limits, and Continuity.		
Partial derivatives, Chain rules. Differentiability of a function		
Extrema of functions of several variables, Lagrange multipliers.		
Double integrals and applications (area and volume).Double integral in polar coordinates		
Triple integrals, Triple integrals in cylindrical and spherical coordinates, applications (volumes).		
Sequences, infinite series.		
Positive term series Convergence tests (Integral, Comparison, Limit comparison, Ratio and Root). Alternating series, Absolute and Conditional Convergence.		
Power series, Radius and Interval of convergence, Power series representations of functions.		
Taylor and McLaurin series.		
Binomial series.		

Course objectives   أهداف المقرر

The main purpose for this course is to introduce the following concepts:

1. Functions of several variables , their domain, graph of a function of two variables, limits and continuity of a function of two
2. Partial differentiation.
3. Double integral and application
4. Double integral in polar coordinates
5. Triple integral and their applications
6. Triple integral in cylindrical and spherical coordinates.
7. Sequences, their limits.
8. Series, geometrical series, convergence tests for positive term series, alternating series and absolute and conditional convergence of series. .
9. Power series, power series representation of functions.
10. McLaurin and Tylor series.

Learning outcomes (understanding, knowledge, and intellectual and scientific skills)

After studying this course, the student is expected to be able to:

• Define the limit and continuity of a function of several variables; describe the partial derivative of a function of severable variables; State the chain rule for functions of severable variables. Outline the local and absolute extrema of functions of several variables.
• Describe the double integral of a function of two variables, tell how to use it to find an area of a plan region, and describe the double integral of a function of two variables, and outline its use to find integrals which cannot be found in Cartesian coordinates
• Describe the triple integral of a function of three variables.
• Write the definition of cylindrical and spherical coordinates and describe their use in finding integrals and volumes of a solid.
• Define the infinite sequence, their limits and properties
• Outline the definition of infinite series, their properties, and the geometric series.
• List all convergence tests for the positive term series (Integral, Comparison, Limit comparison, Ratio and Root). Alternating series, Absolute and Conditional Convergence.
• Define the power series, radius and interval of convergence, power series representations of functions, Taylor and McLaurin series.

Textbooks adopted and supporting references

Title of the book	Author's name	Publisher's name	Date of publication
حساب التفاضل والتكامل للدوال في عدة متغيرات،	تحسين غزال- مصطفى دملخي - سعدون البراهيم.	دار الخريجي للنشر والتوزيع.	
Calculus.	Earl W. Swokowski, Michael Olinick, Dennis Pence, and Jeffery **A.**	PWS Pub. Co.; 6th edition	(January 1994).