University of Asia Pacific
Department of Basic Sciences and Humanities

MTH 201: Math III: Multivariable Calculus
(CSE, Semester: 2-1, Section A and B, Fall 2017, 3.0 Credits)

Marks Distribution	
Attendance	: 10%
Quizzes (best 3)	: 20%
Mid Term I	: 20%
Final Exam	: 50%
TOTAL	: 100%

Course Teacher : Dr. Md. Abdul Alim
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Lecture Time : 2:00 – 3:15pm (Sunday-Sec A, Thursday-Sec B, Room: RhH604);
3:30 – 4:45pm (Sunday-Sec B, Thursday-Sec A, Room: RhH604)
Office Room : 2nd floor, UAP City Campus; (Consultation/Contact: 12:30-2:00 pm; Sun, Thu)

Syllabus

Vectors and the Geometry of Space: Cylinders and Quadric Surfaces. **Vector Functions:** Vector Functions and Space Curves, Derivatives and Integrals of Vector Functions, Arc Length and Curvature, **Motion in Space:** Velocity and Acceleration.

Partial Derivatives: Functions of Several Variables, Limits and Continuity, Partial Derivatives, Tangent Planes and Linear Approximations, The Chain Rule, Directional Derivatives and the Gradient Vector, Maximum and Minimum Values, Lagrange Multipliers.

Multiple Integrals: Double Integrals over Rectangles, Iterated Integrals, Double Integrals over General Regions, Double Integrals in Polar Coordinates, Applications of Double Integrals, Surface Area, Triple Integrals, Triple Integrals in Cylindrical Coordinates, Triple Integrals in Spherical Coordinates, Change of Variables in Multiple Integrals.

Vector Calculus: Vector Fields, Line Integrals, The Fundamental Theorem for Line Integrals, Green's Theorem, Curl and Divergence, Parametric Surfaces and Their Areas, Surface Integrals, Stokes' Theorem, The Divergence Theorem.

Reference Books:

1. Calculus – by Howard Anton, Irl Bivens and Stephen Davis, 10th Edition (Year 2012).
2. Multivariable Calculus - James Stewart, Cengage Learning, [7th Ed].

Lecture Plan

No. of Lectures	Topics
	Vectors and Vector Functions (6 Lectures)
6	Vectors and the Geometry of Space: Cylinders and Quadric Surfaces. Vector Functions: Vector Functions and Space Curves, Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Motion in Space: Velocity and Acceleration.
	Partial Derivatives (6 Lectures)
6	Partial Derivatives: Functions of Several Variables, Limits and Continuity, Partial Derivatives, Tangent Planes and Linear Approximations, The Chain Rule, Directional Derivatives and the Gradient Vector, Maximum and Minimum Values, Lagrange Multipliers.
	Multiple Integrals (6 Lectures)
6	Multiple Integrals: Double Integrals over Rectangles, Iterated Integrals, Double Integrals over General Regions, Double Integrals in Polar Coordinates, Applications of Double Integrals, Surface Area, Triple Integrals, Triple Integrals in Cylindrical Coordinates, Triple Integrals in Spherical Coordinates, Change of Variables in Multiple Integrals.
	Vector Calculus (8 Lectures)
8	Vector Calculus: Vector Fields, Line Integrals, The Fundamental Theorem for Line Integrals, Green's Theorem, Curl and Divergence, Parametric Surfaces and Their Areas, Surface Integrals, Stokes' Theorem, The Divergence Theorem.
2	Review classes