

**1. MATH DEFICIENCY COURSES**

<b>Course Title</b>	<b>Math Deficiency - I</b>
<b>Course Code</b>	<b>MD-001</b>
<b>Credit Hours</b>	3*
<b>Category</b>	Deficiency Course
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow Up</b>	Math Deficiency-II
<b>Course Description</b>	Sets: Definition, various types of set representation, and operations. Relation and Function: Graphical transformation of one and two-dimensional functions, Properties of functions, composition, and inverses of functions, domain and range of the functions, Maximum and minimum values of functions, increasing and decreasing functions, zeros and intercept of functions, piecewise functions, continuity and Discontinuity of functions, polynomials and rational functions, Polynomial long division and Synthetic division, Solution of rational functions, Absolute valued function, properties of absolute valued functions, Asymptotes (Horizontal, vertical and oblique), Exponential functions and their properties, Logs functions and their properties. Systems of Equations: Systems of Two Equations and Two Unknowns, Systems of Three Equations and Three Unknowns. Matrix Algebra: Addition, subtraction, and multiplication. Row Operations and Row Echelon Forms, Augmented Matrices, Determinant of Matrices (2 x 2 and higher-order matrices), Cramer's Rule, Inverse Matrices. Series and Sequences. Trigonometry: Angles in Radians and Degrees, Right Triangle Trigonometry, Law of Cosines & Sines, Area of Triangle, Graphs of Other Trigonometric Functions, Graphs of Inverse Trigonometric Functions, Basic Trigonometric Identities (Pythagorean, Sum and Difference, Double, Half, and Power Reducing), Trigonometric Equations. General Form of a Conic: Parabolas, Circles, Ellipses, Hyperbolas, Degenerate Conics. Polar and Parametric Equations: Polar and Rectangular Coordinates.
<b>TextBook(s)</b>	Textbook of Algebra and Trigonometry Class XI is published by Punjab Textbook Board (PTB) Lahore, Pakistan. Calculus and Analytic Geometry, MATHEMATICS 12 (Mathematics FSc Part 2 or HSSC-II), Punjab Text Book Board Lahore, Pakistan
<b>Reference Material</b>	Gilbert, S. S., B. C. Andy and B. Andrew, B. 2005. Linear Algebra and Its Applications. 4th Ed. Thomson Brooks/Cole, Belmont, CA, USA.