University of Lakki Marwat

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Basic of mathematics (QR-120)

Contact Hours:	**Credit Hours:**
Theory =48	Theory = 3.0

Course contents

1. **Numbers systems**
   1.1. Real Numbers
   1.2. Complex numbers
   - The integers . . . .
   - Rules for addition . . . . .
   - Rules for multiplication . . . .
   - Even and odd integers; divisibility.
   - Rational numbers . . . . .
   - Multiplicative inverses
   - Addition and multiplication.
   - Real numbers: positivity.
   - Powers and roots . . . .
   - Inequalities . . .
   - The complex plane
   - Polar form

2. **Linear and Quadratic Equations**
   - Equations in two unknowns
   - Equations in three unknowns
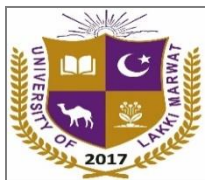   - Quadratic Equations

3. **Functions**
   - Definition of a function
   - Polynomial functions.
   - Graphs of functions
   - Exponential function.

4. **Determinants M a t r ic e s**
   - Determinants of order
   - Properties of 2 X 2 determinants
   - Determinants of order 3 .
   - Properties of 3 X 3 determinants

5. **Differentiation—Fundamentals (Only for Science students excluding zoology and botany)**
- First Principles
- Properties of Derivatives

- Some Standard Derivatives
- Higher Derivatives
- Differentiation—Applications

6. Integration—Fundamentals   **(Only for Science students excluding zoology and botany)**

- Indefinite Integrals
- Definite Integrals
- The Fundamental Theorem of Calculus
- Improper Integrals
- Integration—Applications

7. GEOMETRY

- Distance and Angles
- The Pythagoras theorem.

7.1.**Area and Applications**

- Area of a disc of radius r . . . .
- Circumference of a circle of radius r

7.2.Coordinates and Geometry

- Coordinate systems
- Distance between points.
- Equation of a circle

7.3.Segments, Rays, and Lines

- Segments
- Rays. . . .
- L i n e s ....
- Ordinary equation for a line

8. Trigonometry

- Radian measure
- Sine and cosine.
- The graphs.
- The tangent

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