

**LORETO COLLEGE**  
**Department of Mathematics**

**TIME PLAN 2019-2020**

**Name of the teacher : Dr Satyabrota Kundu**

**Initials : SK**

**Teaching Objectives:**

- To impart comprehensive knowledge in theoretical and empirical perspectives on the core mathematical issues.
- To indoctrinate the fundamental mathematical tools required for empirical appraisal of various mathematical problems.
- To give exposure to analytical and logical matters subsumed in mathematical theories.

**1<sup>st</sup> Semester Topic-wise Time Plan**

<b>Topics</b>	<b>Hours allotted</b>	<b>Topics (as per curriculum)</b>	<b>Teaching method</b>	<b>Learning outcome (output)</b>	<b>Assessment</b>
Algebra I	10	<ol style="list-style-type: none"> <li>1. Complex Numbers</li> <li>2. Polynomials</li> <li>3. Rank of a matrix</li> <li>4. Statements of : (i) If a polynomial <math>f(x)</math> has opposite signs for two real values <math>a</math> and <math>b</math> of <math>x</math>, the equation <math>f(x) = 0</math> has odd number of real roots between <math>a</math> and <math>b</math>. If <math>f(a)</math> and <math>f(b)</math> are of same sign, either no real root or an even number of roots lies between <math>a</math> and <math>b</math>. (ii) Rolle's Theorem and its direct applications. Relation between roots and coefficients, symmetric functions of roots, transformations of equations. Cardan's method of solution of a cubic equation.</li> </ol>	<p>Class lecture and problem solving sessions.</p> <p>Revisions and doubt clearing slots</p>	<p>Achieve a fervent understanding of basic algebra.</p>	<p>Class test and home assignments</p>
Differential Calculus-I	20	<ol style="list-style-type: none"> <li>1. Rational numbers, Geometrical</li> </ol>	<p>Class lecture and problem</p>	<p>Gather</p>	<p>Class test</p>

		<p>representations, Irrational number, Real number represented as point on a line — Linear Continuum.</p> <p>Acquaintance with basic properties of real number (No deduction or proof is included).</p> <p><b>2.</b> Real-valued functions defined on an interval, limit of a function (Cauchy's definition). Algebra of limits. Continuity of a function at a point and in an interval. Acquaintance (on proof) with the important properties of continuous functions no closed intervals. Statement of existence of inverse function of a strictly monotone function and its continuity.</p> <p><b>3.</b> Derivative</p> <p><b>4.</b> Successive Derivative</p> <p><b>5.</b> Functions of two and three variables</p> <p><b>6.</b> Applications of Calculus</p>	<p>solving sessions. Revisions and doubt clearing slots</p>	<p>theoretical insights of the fundamental calculus.</p>	<p>and home assignments</p>
Differential Equation-I	<b>10</b>	<p>1. Order, degree and solution of an ordinary differential equation (ODE) in presence of arbitrary constants, Formation of ODE.</p> <p>2. First order equations</p> <p>3. Second order linear equations</p> <p>4. Second order differential equations</p>	<p>Class lecture and problem solving sessions. Revisions and doubt clearing slots</p>	<p>Getting skilled in problem solving techniques</p>	<p>Class test and home assignments</p>
Coordinate Geometry	<b>20</b>	<p>1. Transformations of Rectangular axes</p> <p>2. General equation of second degree in x and y.</p> <p>3. Pair of straight lines</p> <p>4. Equations of pair of tangents from an</p>	<p>Class lecture and problem solving sessions. Revisions and doubt clearing slots</p>	<p>Developing a strong aptitude in making basic aspects of Geometry.</p>	<p>Class test and home assignments</p>

		<p>external point, chord of contact, poles and polars in case of General conic.</p> <p>5. Polar equation of straight lines and circles. Polar equation of a conic referred to a focus as pole. Equation of chord joining two points. Equations of tangent and normal.</p> <p>6. Sphere and its tangent plane. Right circular cone.</p>		
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