

LORETO COLLEGE
Department of Mathematics

TIME PLAN 2022-2023

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.

1st Semester Topic-wise Time Plan

Topics	Hours allotted	Topics (as per curriculum)	Teaching method	Learning outcome (output)	Assessment
Algebra I	10	<p>1. Complex Numbers</p> <p>2. Polynomials</p> <p>3. Rank of a matrix</p> <p>4. Statements of : (i) If a polynomial $f(x)$ has opposite signs for two real values a and b of x, the equation $f(x) = 0$ has odd number of real roots between a and b. If $f(a)$ and $f(b)$ are of same sign, either no real root or an even number of roots lies between a and b. (ii) Rolle's Theorem and its direct applications. Relation between roots and</p>	<p>Class lecture and problem solving sessions. Revisions and doubt clearing slots</p>	<p>Achieve a fervent understanding of basic algebra.</p>	<p>Class test and home assignments</p>

Differenti al Calculus- I	20	<ol style="list-style-type: none"> 1. Rational numbers, Geometrical representations, Irrational number, Real number represented as point on a line — Linear Continuum. Acquaintance with basic properties of real number (No deduction or proof is included). 2. 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 	Class lecture and problem solving sessions. Revisions and doubt clearing slots	Gather theoretical insights of the fundamental calculus.	Class test and home assignments
Differenti al Equation -I	10	<ol style="list-style-type: none"> 1. Order, degree and solution of an ordinary differential equation (ODE) in presence of arbitrary constants, Formation of ODE. 2. First order 	Class lecture and problem solving sessions. Revisions and doubt clearing slots	Getting skilled in problem solving techniques	Class test and home assignments

Coordinate Geometry	20	<ol style="list-style-type: none"> 1. Transformations of Rectangular axes 2. General equation of second degree in x and y. 3. Pair of straight lines 4. Equations of pair of tangents from an external point, chord of contact, poles and polars in case of General conic. 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 	<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>
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