DEPARTMENT OF MATHEMATICS

# NABAJYOTI COLLEGE, KALGACHIA

## Program Outcome, Program Specific Outcome and Course Outcome

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| **Program Outcome** | After successful completion of Three Year B.Sc/B.A Program in Mathematics a student will have a good understanding of major concepts in all disciplines of Mathematics | |
| **Program Specific Outcome Outcome** | After successful completion of the program students will be able<br>• to develop patience and perseverance when solving critical problems and logical reasoning.<br>• To improve the mathematical skills in the practical life.<br>• To enhance the critical thinking ability of the students<br>• To inculcate interest among the students to participate in seminars, workshops, conferences etc.<br>• To develop their reasoning capacity.<br>• To understanding the historical and contemporary role of Mathematics and be able to place the discipline properly in the context of other human intellectual achievement.<br>• To know how and when to use technology in the study of Higher Mathematics. | |
| **Courser Outcome** | Courser Outcome of Choice Based Credit System(CBCS) | |
| | Course | Outcome |
| | C1.1 Calculus (including Practical) | After going through this course the students will be able to<br>• Differentiate functions<br>• Find tangent, normal, curvature, asymptotes etc.<br>• Apply Calculus in real life problems<br>• Formulate mathematical models |
| | C 1.2 Algebra | After going through this course the students will be able to<br>• Describe various algebraic structures on sets<br>• Identify the algebraic structure present in different branches of Sciences |
| | C 2.1 Real Analysis | After going through this course the students will be able to<br>• identify the properties of the number system.<br>• Describe various analytical properties of the number system. |
| | C2.2 Differential Equations | After going through this course the students will be able<br>• use the technique to solve |

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| | | differential equations<br>• apply these techniques in various mathematical models used in real life problems. |
| | C3.1 Theory of Real Functions | After going through this course the students will be able to<br>• discuss limit, continuity and differentiability of real valued functions .<br>• expand functions in series and different form of remainders |
| | C3.2 Group Theory I | After going through this course the students will be able to<br>• describe various group structures on sets<br>• identify the group structures present in different branches of sciences |
| | C 3.3 Analytical Geometry | After going through this course the students will be able to<br>• sketch parabola ,ellipse and hyperbola<br>• solve various geometrical problems analytically. |
| | C4.1 Multivariate calculus | After going through this course the students will be able to<br>• extend the concepts from one variable calculus to function of several variables<br>• demonstrate the ability to think critically and solving application of real world problems involving double /triple integrals . |
| | C4.2 Numerical Methods (including Pract.) | After going through this course the students will be able to<br>• discuss various numerical methods and interpolation formulae<br>• apply numerical techniques for solving differential equation |

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| | C4.3 Ring Theory | After going through this course the students will be able to<br>• describe various ring structures on sets<br>• apply theorems ,proof or solution techniques to solve real world problems. |
| | C5.1 Complex Analysis | After going through this course the students will be able to<br>• complex number system , its differentiation and integration<br>• Learn some elementary functions and valuate contour integrals.<br>• Understanding the role of Cauchy-Goursat theorem and the Cauchy integral formula.<br>• Expand some simple functions as their Taylor and Laurent series, classify the nature of singularities , find residues and apply Cauchy Residue theorem to evaluate integrals. |
| | C5.2 Linear Algebra | The course enable the students to :<br>• Learn the concept of linear independence of vectors over a field, and the dimension of a vector space<br>• Basic concepts of linear transformations, dimension theorem matrix representation of a linear transformation, and the change of coordinate matrix.<br>• Compute the characteristics polynomial, eigen values, eigen vectors, and eigen space as well as the geometric and the algebraic multiplicities of an eigen value and apply the basic diagonalization result. |
| | C 6.1 Riemann Integration and Metric Spaces | After going through this course the students will be able to<br>• Riemann integration ,improper integrals<br>• Describe various properties of metric space. |

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| | C 6 .2 Partial Differential Equations (including practical) | After going through this course the students will be able to<br>*Formulate, Classify and transform first order PDE into canonical form.<br>* Learn about method of characteristics and separation of variables to solve first order PDEs<br>*Learn about Cauchy problem for second PDE and homogeneous and non homogeneous wave equation. models used in heat , wave equation.<br>*Laplace equation and their solutions make mathematical formulations and their solutions of various physical problems .<br>* Design mathematical model using PDE. |
| | DSE 5.1 Number Theory | After going through this course the students will be able to<br>• Describe the basic properties of Fluid Mechanics |

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| Program Specific Outcome | | |
| Courser Outcome | Courser Outcome of Choice Based Credit System(CBCS) | |
| | DSE 5056 : Spherical Trigonometry & Astronomy | The course will enable the students to :<br>• Know about properties of spherical , polar triangles and fundamental of spherical triangle.<br>• Learn about the celestial sphere , circumpolar star ,rate of change of zenith distance and azimuth .<br>• Learn about Keplar's laws of planetary motion, Cassini's hypothesis, differential for refraction . |
| | DSE :6046 Hydromechanics | After going through this course the students will be able to describe the basic properties of fluid mechanics. |
| | DSE :Group Theory | After going through this course the students will be able to<br>• Describe various group structures on sets<br>• Identify the group structures present in different branches of science |
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