

<p>PROGRAMME NAME</p>	<p>BSc. HONOURS IN MATHEMATICS</p>
<p>PROGRAMME SPECIFIC OUTCOME</p>	<p>“The laws of nature are but the mathematical thoughts of God” by Euclid.</p> <p>“Mathematics is the language of all sciences.”</p> <p>So, we encourage each student for higher study and try to understand the beauty of the subject. Mathematics is the only subject which supports both pure and social sciences to develop their areas. Mathematics is also used as a tool to simplify and solve different complicated problems in our modern life. Without Mathematics, any progress is not possible So, we can say “Mathematics for all”</p>

HONOURS COURSE OUTCOMES

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOME
I	CC-1	CALCULUS, GEOMETRY & DIFFERENTIAL EQUATIONS	In this course we teach basic application of calculus and geometry of two and three dimensions. We also teach the method of solving first order linear and non-linear differential equations along with some applications in geometry and mechanics.
I	CC-2	ALGEBRA	Complex numbers, theory of equations, some basic inequalities, fundamentals of number theory and some properties of matrices along with its applications are taught in this course.
I	AECC-1	COMPULSORY ENVS	AECC-1 is a compulsory general paper of 1 st year undergraduate student. In this paper We teaches the fundamentals of environmental studies. This paper introduces the fundamental principles and concept of environmental science , ecology and related interdisciplinary subject such as policy , law ,Economics, pollution control , resources management etc.
II	CC-3	REAL ANALYSIS	In this module, we teach the behavior of real numbers, sequences and series of real numbers, and different properties of real functions.
II	CC-4	DIFFERENTIAL EQUATION AND VECTOR CALCULUS	In this course, we teach different methods of solving higher order differential equations and its applications. We also teach series solution about ordinary and singular points. Furthermore, limit, continuity, differentiation and integration of vector-valued function are taught here.

II	AECC-2	COMMUNICATIVE ENGLISH/MIL (BENGALI/FRENCH)	COURSE OUTCOME GIVEN SHEET CONTAINING IN ENGLISH , BENGALI , FRENCH AECC-2 (SEMESTER-2)
III	CC-5	THEORY OF REAL FUNCTIONS & INTRODUCTION TO METRIC SPACE	We acquaint our students about some properties of limit, continuity, differentiability and its application for real valued function. We also teach mean value theorems, expansion of functions and some basic properties of metric spaces in this course.
III	CC-6	GROUP THEORY-I	In this topic, we teach basic concepts of groups, subgroups, cyclic groups and normal subgroups. Furthermore, direct product of finite number of groups, factor groups, group homomorphisms, isomorphisms along with applications are taught in this module.
III	CC-7	NUMERICAL METHODS & NUMERICAL METHODS LAB	In this topic, we teach interpolation , numerical differentiation, numerical integration, solution of transcendental and polynomial equations, solution of system of linear algebraic equations and solutions of ordinary differential equations . In the practical paper, we teach preliminary concepts of C-Language and teach how to solve some numerical problems using C.
III	SEC-1	LOGIC AND SETS	In this skill enhancement course, we acquaint our students about some basic logic, propositional calculus, sets, subsets and different types of set operations.

IV	CC-8	RIEMANN INTEGRATION AND SERIES OF FUNCTIONS	In this core course, we introduce Riemann integration and its different properties, improper integral and convergence of Beta-Gamma function. Further, sequence of functions, series of functions, Fourier series, power series and their uniform convergence are also taught.
IV	CC-9	MULTIVARIATE CALCULUS	Functions of several variables, limit continuity, differentiability, chain rule, extrema of functions, double integral, triple integral, Greens, Gauss and Strokes theorem are taught in this course.
IV	CC-10	RING THEORY AND LINEAR ALGEBRA-I	In this course, we teach rings, subrings, integral domain, fields, ideal, ring homomorphisms and isomorphism theorems
IV	SEC-2	GRAPH THEORY	We taught Eulerian circuits, Eulerian graphs, Hamiltonian cycles, representation of a graph by matrix. Some applications of this topic like Travelling salesman's problem, shortest path are also taught here.
V	CC-11	PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS	In this topic, we taught partial differential equations. Furthermore, heat equation, wave equation and Laplace equation together with their solutions are taught in this module.
V	CC-12	MECHANICS-I	Dynamics of a particle, dynamics of rigid bodies and statics are taught in this topic. Central force, stability of orbits, motion under inverse square law, constrained motion, moments of inertia, D Alembert principle along with its applications, virtual work, forces in three dimension, centre of gravity etc are taught under this module.

V	DSE-1	LINEAR PROGRAMMING	It is a special case of mathematical programming. Formerly, it is a technique for optimization of a linear objective function subject to linear equality and inequality constraints.
V	DSE-2	PROBABILITY AND STATISTICS	In this topic, we taught random variables(discrete and continuous), cumulative distribution function, probability mass/ density functions, expectation, moments, moment generating function, characteristic functions. Furthermore, Chebyshev inequality, linear regression, laws of large number, central-limit theorem and Markov chains are also included in this module.
VI	CC-13	METRIC SPACE AND COMPLEX ANALYSIS	In this module, different properties of metric space like completeness, compactness, totally boundedness are taught. Banach Fixed point theorem and its applications are also taught. In the complex analysis, analytic functions, Cauchy integral theorem, Cauchy-Goursat theorem, Liouville's theorem, contour integrals are taught here.
VI	CC-14	RING THEORY AND LINEAR ALGEBRA	In this topic, we taught polynomial rings, principal ideal domain, Euclidean domain, reducibility and irreducibility tests, dual spaces, dual basis, diagonalizability, Cayley-Hamilton theorem. Furthermore, inner product spaces, Gram-Schmidt orthogonality process, least square approximations, normal and self adjoint operators and spectral theorem are also included in this topic.

VI	DSE-3	PROJECT WORK	We encourage each students to select their favorite topics from the above syllabus and write something and submit for their presentation.
VI	DSE-4	MECHANICS-II	In this topic, Gallilean transformation, equilibrium of fluid and floating bodies, isothermal and adiabatic changes in gases, convective equilibrium, stress quadratic are taught. Furthermore, Lagrangian equation of motion and Gibbs-Appell's principle of least constraints are included in this module.