Department of Mathematics , Tarakeswar Degree College

Course Outcomes Of B.Sc. Mathematics General Course Under CBCS

Course Structure

SEM I : CC1A

SEM II : CC1B

SEM III : CC1C

SEM IV : CC1D

SEM V : DSE1A

SEM VI : DSE1B

NOTE : Students must opt one SEC

Course in each semester from Sem-III to Sem-VI from any discipline.

SEM-I (CC1A) DIFFERENTIAL CALCULUS :

COURSE OUTCOMES :

- Student will acquaint with the analytical definition (ε-δ definition) of limit continuity and differentiability and will able to dealt with the conceptual problems of differentiation, local maxima-minima of a function and limits of indeterminate forms.
- Student will understand the concept of successive differentiation and partial differentiation. Also they will able to solve the problems on these topics using Leibnitz's theorem or Euler's theorem as the case may be.
- Using the concept of differentiation(total & partial) they will able to solve the problems relating to tangents & normals, curvature, asymptotes, singularities and finally they will able to handle the problem of curve tracing.
- Students will learn Rolle's Theorem, Mean Value Theorem, Taylor's Series, Maclaurin's Series and they will able to expand different types of functions in infinite series.

SEM-II (CC1B) DIFFERENTIAL EQUATIONS :

COURSE OUTCOMES :

- Students will able to identify and solve different types of first order first degree and first order higher degree differential equations.

- Students will able to identify and solve the problems on linear homogeneous and non-homogeneous differential equations in different method.
- Students will acquaint the concept of partial differential equations , its order and degree and finally able to solve partial differential equations using Lagrange's method and Charpit's method and able to classify second order partial differential equations.

SEM-III (CC1C) REAL ANALYSIS :

COURSE OUTCOMES: After completion of this course, students will

- acquaint with different types of subsets in R and some useful properties of R.
- acquaint with the concept of different notions in connection with sequence in R and the notion of convergence sequence including relating theorems.
- understand the idea of infinite series and its convergence and will able to test the convergence of a series using different tests.
- acquaint the notion of sequence and series of functions ; and also with the notion of pointwise and uniform convergence and some related tests.
- acquaint the concept of power series and its convergence.

SEM-IV (CC1D) ALGEBRA :

COURSE OUTCOMES: At the end of this course , students will

- acquaint with the definition of group and the examples of groups from different of Mathematics ; like $\boldsymbol{Z_n}$[the group of integer modulo *n*] ; ***U(n)*** [the group of units under multiplication modulo *n*] ; **GL(n,$\mathbb{R}$)** [the general linear group], etc..
- acquaint with the definition of subgroups and it's examples including the centre of a group, coset and index of a subgroup and the Lagrange's Theorem on group.
- know the definition of normal subgroup and it's examples ; also the quotient group.
- understand the definition of Ring, both commutative and non-commutative and the examples of two types of rings like$\boldsymbol{Z_n}$**,** the ring of integers, **C [a,b]**of all continuous functions on [a,b], the ring of matrices etc. .
- acquaint with the definitions of Subrings, Ideals, Integral domains and Field with their examples.

SEM-V (DSE COURSE) (ANY ONE OF THE FOLLOWING TO DSE COURSE):

BMG5DSE1A (MATRICES)

COURSE OUTCOMES **:**After the completion of their course, students will

- understand the notion of vector space and basis of a vector space ; able to find basis of the vector space $\mathbb{R}, \mathbf{R_2}, \mathbf{R_3}$over $\mathbb{R}$.
- understand the concept of linear transformation and the matrix form of basic geometric transformation.
- understand the interpretation of eigen values and eigen vectors for such transformations.
- acquaint with different types of matrices and the rank of a matrix, the relationship between rank and linear transformation.
- understand the method of reduction to normal form; the method of solutions of linear homogeneous and non-homogeneous equations.
- understand the diagonal form of a matrix and the method of reduction to diagonal form; method of solution of linear equations using matrices and its application in different field like Physics, Chemistry etc. .

BMG5DSE1A3 (LINEAR ALGEBRA)

COURSE OUTCOMES : At the end of this course students will

* understand the concept of vector space & sub space and its algebraic properties; the concepts of linear combinations, linear span and linear independence; also the concept of basis & dimension of subspaces.

* acquaint with the concept of linear transformation and the related concepts like null space, the rank and nullity of linear transformations; the matrix representation of linear transformation & its algebraic properties.

* understand the concept of dual space, dual basis, double dual, eigen values and eigen vectors, characteristic polynomial, isomorphism between two vector spaces and the properties of isomorphism between vector spaces.

SEM-VI (DSE COURSE):

BMG6DSE1B3(LINEAR PROGRAMMING)

COURSE OUTCOMES: After completion of this course, students will

*learn about different the notion and applicability of Linear programming problems through different examples from various fields of Mathematics and will able to solve the LPP of two variables by Graphical method.

*learn about different terms related to LPP like convex sets, Hyper planes etc.

*learn to solve LPP by simplex method and Big M method.

*able to construct dual of an LPP and learn the relationship between dual and its primal.