Mathematics Syllabus & Evaluation Scheme For

B.Sc.(PCM III Year)

Dev Bhoomi Institute of Management Studies, Dehradun

Affiliated to

Sri Dev Suman Uttarakhand University, Badshahithol, Tehri, Uttrakhand

S. No.	SUBJECT	EVALUATION SCHEME III Year		
		SESSIONAL EXAM Theory		Subject Total
		Ext.	Int.	
1	Linear Algebra and Linear Programming Problems	65	00	200
2	Complex Analysis	65	00	
3	Numerical Analysis	70	00	

	Dev Bhoomi Institute Of Management Studies	**YEAR: III**
	Department of Applied Science	
	Total Contact Hours: 60	**LTP -3-0-0**	**External Marks: 65**
Course Title: Linear Algebra and Linear Programming Problems	**Course Code: BM-301**	**Duration of External Exam:2:30 Hours**

Prerequisite: Student should have the knowledge of basic concept of Linear Algebra and Linear Programming Problems

B.Sc. – III Year

Mathematics

Linear Algebra and Linear Programming Problems

(Paper Code: BM- 301)

1. Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, dimension of subspaces, linear transformation, null spaces, range, rank and nullity of a linear transformation, matrix representation of a linear transformation, algebra of linear transformations.
2. Dual space, dual basis, double dual, characteristic polynomial, eigen values and eigen vectors, isomorphisms, isomorphism theorems, invertibility and isomorphisms, change of coordinate matrix.
3. LPP, graphical approach for solving some LPP, convex sets, supporting and separating hyper planes.
4. Theory of simplex method, optimality and unboundedness, the simplex algorithm, simplex method in tableau format, introduction to artificial variables.
5. Two phase method, Big-M method and their comparison, duality, formulation of the dual problem, primal-dual relationships, economic interpretation of the dual.

Books Suggested:

1. Stephen H.Friedberg, Arnold J. Insel, Lawrence E.Spence, Linear Algebra
2. Linear Algebra, Dr. Manoj K.Jadaun, Dr. A.K. Mittal, SJ Publication

Course Outcome	Description
CO1	Student get to know all the basic fundamentals of matrices
CO2	Can solve a linear equation and calculate eigen value and eigen vectors for any operation
CO3	Apply knowledge of matrices and vectors in various applications
CO4	Apply knowledge of linear programming to get optimal solution

	Dev Bhoomi Institute Of Management Studies	**YEAR: III**
	Department of Applied Science	
	Total Contact Hours: 60	**LTP -3-0-0**	**External Marks: 65**
Course Title: complex analysis	**Course Code: BM-302**	**Duration of External Exam: 2:30 Hours**

Prerequisite: Student should have the knowledge of basic concept of COMPLEX ANALYSIS

B.Sc. III year
Complex analysis (paper-II)

1. Complex numbers and basic properties, geometric representation of complex numbers, trigonometrical and hyperbolic complex functions, analytical, Cauchy- Riemann equations, harmonic functions.
2. Conformal mappings, geometric representation, transformations, theorems on conformal mapping, magnification, the circle, inverse point w.r.t a circle, some elementary transformations, fixed point and normal form of a bilinear transformations.
3. Complex integration, cauchys integral theorem, cauchys fundamental theorem of integration, cauchys integral formula for the derivative of analytic functions, morera's theorem
4. Cauchys inquality, taylors theorem, laurents series, liouvilles theorem
5. Zeros and singularities of analytic functions

Books Suggested:

1. James Ward Brown and Ruel V. Churchill, complex variables and applications
2. Dr. Sudhir K. Pundir, Dr. V.P. Pandey, Analysis, Pragati Prakashan

Course Outcome	Description
CO1	Student gets to know the need for coplex number system and explain how is related to other existing number systems
CO2	Define a function of complex variable and carry out basic mathematical operations with complex numbers
CO3	Use of cauchy reimann equation to show that a function is analytic
CO4	The conditions for a complex variable function to be analytic and harmonic
CO5	Understand the concept of sequences and series with respect to the complex number system

	Dev Bhoomi Institute Of Management Studies	**YEAR: III**
	Department of Applied Science	
	Total Contact Hours: 60	**LTP -3-0-0**	**External Marks: 70**
Course Title: Numerical analysis	**Course Code: BM-503**	**Duration of External Exam: 2:30 Hours**

Prerequisite: Student should have the knowledge of basic concept of NUMERICAL ANALYSIS

B.Sc. III year
Numerical analysis (paper-III)

1. Finite differences, differences operator, factorial notation, interpolation with equal intervals.
2. Interpolation with unequal intervals, divided differences, central differences stirling and bassel formula (application only)
3. Numerical differentiation and integration, simpson's 1/3 and 3/8 rule, weddle's rule trapezoidal rule and their accuracy
4. Numerical solution of algebraic and transcendental equation, iterative bisection, regula falsi, newton rapshon, graeffe method
5. Numerical solution of differential equation, picard's euler, modified euler, runge-kutta method

Books Suggested:

1. B.Bradie, A friendly introduction to numerical analysis, Pearson Education
2. M.K.Jain, S.R.K. Iyenger and R.K. Jain, Numerical methods for scientific and engineering computation

Course Outcome	Description
CO1	Student gets to understand the elements of error analysis for numerical methods and certain proofs
CO2	Introduction to the field of numerical anaysis
CO3	Numerical methods to solve interpolation based problems
CO4	Numerical methods to solve probability based problems
CO5	Understand theoretical and practical aspects of the use of numerical analysis