

**GOVT. M. H. COLLEGE OF HOME SCIENCE &  
SCIENCE FOR WOMEN (AUTONOMOUS),  
JABALPUR (M.P.)**

**UG SYLLABUS  
SESSION 2023-2024**



**MATHEMATICS**

**Department of Mathematics & Computers**

## MATHEMATICS



### B.sc I Year

PAPER	TITLE	CREDIT
Major Paper - I	Algebra, Vector Analysis and Geometry	6 credit
Paper – II / Minor / Elective	Calculus and Differential Equations	6 credit

### B.sc II Year

PAPER	TITLE	CREDIT
Major Paper - I	Abstract Algebra and Linear Algebra	6 credit
Paper – II / Minor / Elective	Advanced Calculus and Partial Differential Equations	6 credit

### B.sc III Year

PAPER	TITLE	CREDIT
Group A Paper - I	Numerical Methods and Scientific Computation	6 credit
Group A Paper - II	Elements of Discrete Mathematics	6 credit
Group B Paper - I	Probability and statistics	6 credit
Group B Paper - II	Integral Transform	6 credit
Minor	Fundamental of Boolean Algebra	6 credit

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Department of Mathematics & Computer

Session 2023 – 2024

Class	Subject	Year	Max. Marks	Min. Marks	Course Code	Course Title
B.Sc.	Mathematics	I	30+70		SI-MATH1T	Algebra, Vector Analysis and Geometry (Paper I)

**Part B: Content of the Course**

**Total No. of Lectures (in hours per week) : 3 hours per week**

**Total Lectures 90 hours**

Unit	Topics	No. of Lectures
I	1.1 Historical background: 1.1.1. Development of Indian Mathematics: Later Classical Period (500-1250) 1.1.2 A brief biography of Varahamihira and Aryabhata 1.2 Rank of a Matrix 1.3 Echelon and Normal form of a matrix 1.4 Characteristic equations of a matrix 1.4.1 Eigen-Values 1.4.2 Eigen –vectors	15
II	2.1 Cayley Hamilton theorem 2.2 Application of Cayley Hamilton theorem to find the inverse of a matrix . 2.3 Application of matrix to solve a system of linear equations 2.4 Thoerems on consistency and inconsistency of a system of linear equations. 2.5 Solving linear equations up to three unknowns	18
III	3.1 Scalar and Vector products of three and four vectors 3.2 Reciprocal vectors 3.3 Vector differentiation 3.3.1 Rules of differentiation 3.3.2 Derivatives of Triple Products 3.4 Gradient Divergence and Curl 3.5 Directional derivatives 3.6 Vector Identities 3.7 Vector Equations	18
IV	4.1 Vector Integration 4.2 Gauss theorem (Without proof) and problems based on it 4.3 Green theorem (without proof) and problems based on it 4.4 Stoke theorem (without proof) and problems based on it	15
V	5.1 General equation of second degree 5.2 Tracing of conics 5.3 System of conics	24

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	<p>5.4 Cone</p> <p>5.4.1 Equation of cone with given base</p> <p>5.4.2 Generators of cone</p> <p>5.4.3 Condition for three mutually perpendicular generators</p> <p>5.4.4 Right circular cone</p> <p>5.5 Cylinder</p> <p>Equation of cylinder and its properties, Right Circular Cylinder Enveloping Cylinder</p>	
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**Keywords:**

Indian Mathematics. Rank of a Matrix Scalar and Vector products. Vector differentiation. Vector identities. Vector integration. General equation of second degree. Tracing of conics. System of conics. Equation of conc. Equation of cylinder.

**Part C- Learning Resources**

**Text Books, Reference Book, other Resources**

**Suggest Reading :**

**Text Books:**

1. K. B. Datta: Matrix and Linear Algebra. Prentice Hall of India Pvt. Ltd. New Delhi 2000.
2. Shanti Narayan : A Text Book of Vector Calculus, S. Chand & Co. New Delhi. 1987
3. S. L. Loney: The Elements of Coordinate Geometry Part-I. New Age International (P) Ltd., Publishers. New Delhi 2016.
4. P. K. Jain and Khalil Ahmad: A text book of Analytical Geometry of Three Dimensions. Wiley Eastern Ltd. 1999.
5. Gerard G. Emch. R. Sridharan, M.D. Srinivas: Contribution to the History of Indian Mathematics. Hindustan Book Agency. Vol.3. 2005.

**Reference Books:**

1. Chandrika Prasad: A text Book on Algebra and Theory of Equations. Pothishala pvt.Ltd., Allahabad .2017
2. N. Jacobson : Basic Algebra Vol. I and II. W. H. Freeman. 2009
3. I. S. Luther and I.B.S. Passi : Algebra Vol. I and II. Narosa Publishing House. 1997
4. N. Saran and S.N. Nigam: Introduction to Vector Analysis. Pothishala Pvt. Ltd. Allahabad. 1990
5. Murray R. Spicgel: Vector Analysis. Schaum Publishing Company. New York. 2017

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6. Gorakh Prasad and H.C. Gupta : Text Book on Coordinate Geometry Pothishala Pvt.Ltd.Allahabad 2000
7. P. K. Jain and Khalil Ahmad: A text book of Analytical Geometry of Two Dimensions. Macmillan India Ltd.1994
8. S.L. Loney: The Elements of Coordinate Geometry Part -2,Macmillan. 1923
9. N. Saran and D.N. Gupta : Three Dimensional Coordinate Geometry. Pothishala Pvt. Ltd. Allahabad 1994
10. R.J.T. Bell: Elementary Treatise on Coordinate Geometry of Three Dimensions. Macmillan India Ltd.1994
11. Bibhutibhusan Datta and Avadhesh Narayan Singh: History of Hindu Mathematics. Asia Publishing House. 1962.

**Suggest Digital Platforms Web links:**

<https://eggp.inflibnet.ac.in>

<https://freevediolectures.com/university/iil-roorkee>

<https://www.highereducation.mp.gov.in/?page=xhzlQmZwkyIQo2b%2ky5G7w%3d%3d>

<https://www.bhojvirtualuniversity.com>

**Suggest Equivalent online courses:**

<https://nptel.ac.in/courses/111105122/>

<https://nptel.ac.in/courses/111107112/>

<https://nptel.ac.in.courses/111/101/111101080/>

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Class	Subject	Year	Max. Marks	Min. Marks	Course Code	Course Title
B.sc.	Mathematics	I	30+70		SI-MATH2T Major-II/Minor/Elective)	Calculus and Differential Equations (Paper- 2)

**Part B: Content of the Course**

**Total No. of Lectures (in hours per week) : 3 hours per week**  
**Total Lectural : 90 hours**

Unit	Topics	No. of Lectures
I	1.1 Historical background: 1.1.1 Development of Indian Mathematics Ancient and Early Classical Period (till 500 CE) 1.1.2 A brief biography of Bhaskaracharya (with special reference to Lilavati) and Madhava 1.2 Successive differentiation 1.2.1 Leibnitz theorem 1.2.2 Maclaurin's series expansion 1.2.3 Taylor's series expansion 1.3 Partial Differentiation 1.3.1 Partial derivatives of higher order 1.3.2 Euler's theorem on homogeneous functions 1.4 Asymptotes 1.4.1 Asymptotes of algebraic curves 1.4.2 Condition for Existence of Asymptotes 1.4.3 Parallel Asymptotes 1.4.4 Asymptotes of polar curves	18
II	2.1 Curvature 2.1.1 Formula for radius of Curvature 2.1.2 Curvature at origin 2.1.3 Centre of Curvature 2.2 Concavity and Convexity 2.2.1 Concavity and Convexity of curves 2.2.2 Point of Inflexion 2.2.3 Singular point 2.2.4 Multiple points 2.3 Tracing of curves 2.3.1 Curves represented by Cartesian equation 2.3.2 Curves represented by Polar equation	18

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<b>III</b>	3.1 Integration of transcendental functions 3.2 Introduction to Double and Triple Integral 3.3 Reduction formulae 3.4 Quadrature 3.4.1 For Cartesian coordinates 3.4.2 For Polar coordinates 3.5 Rectification 3.5.1 For Cartesian coordinates 3.5.2 For Polar coordinates	<b>18</b>
<b>IV</b>	4.1 Linear differential equations 4.1.1 Linear equation 4.1.2 Equations reducible to the linear form 4.1.3 Change of variables 4.2 Exact differential equations 4.3 First order and higher degree differential equations 4.3.1 Equations solvable for x, y and p 4.3.2 Equations homogenous in x and y 4.3.3 Clairaut's equation 4.3.4 Singular solutions 4.3.5 Geometrical meaning of differential equations 4.3.6 Orthogonal trajectories	<b>18</b>
<b>V</b>	5.1 Linear differential equation with constant coefficients 5.2 Homogeneous linear ordinary differential equations 5.3 Linear differential equations of second order 5.4 Transformation of equations by changing the dependent independent variable 5.5 Method of variation of parameters	<b>18</b>

**Keywords/Tags :**


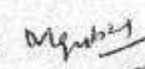
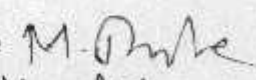


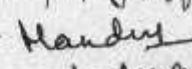
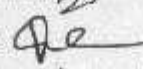
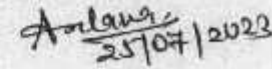
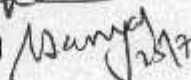
Indian Mathematics. Successive differentiation. Partial Differentiation. Asymptotes. Curvature. Tracing of curves. Quadrature. Rectification. Linear differential equations. Method of variation of parameters.

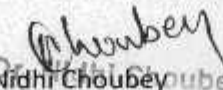
**Suggest Readings:**

**Text Books:**

1. Gorakh Prasad: Differential Calculus Pothishala Private Ltd. Allahabad.2016
2. Gorakh Prasad: Omtegral Calculus Pothishala Private Ltd.Allajabad,2015 .
3. M.D.Raisinghania: Ordinary and Partial Differential Equations. S Chand & Co Ltd, 2017
4. Gerard G.Emch, R.Sridharan and M.D. Srinivas: Contributions to the History of Indian Mathematics. Hindustan Book Agency , Vol.3, 2005.
5. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तके

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**Reference Books:**

1. N.Piskunov: Differential and Integral Calculus. CBS Publishers, 1996.
2. G.F.Simmons: Differential Equations, Tata McGraw Hill 1972.
3. E.A.Codington: An Introduction to ordinary differential Equation, Prentice Hall of India, 1961
4. D.A. Murray: Introductory Course in Differential Equations, Orient Longman (India) 1967.
5. H.T.H Piaggio: Elementary Treatise on Differential Equations, and their Application, C.B.S.Publishing House
6. Bibhutibhusan Datta and Avadhesh Narayan Singh History of Hindu Mathematics.. Asia Publishing House 1962.

**Suggest Digital Platforms Web links .**

<https://eppg.inflibnet.ac.in>

<https://freevidelectures.com/university/iit-roorkee>

<https://www.highereducation.mp.gov.in/?page=xhzlQo2b%Fy5G7w%3D%3D>

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Department of Mathematics & Computer

Session 2023 – 2024

Class	Subject	Year	Max. Marks	Credit Value	Course Code	Course Title
B.Sc.	Mathematics	II	30+70	6	S2-MATH1T	Abstract Algebra and Linear Algebra (Paper-I)

Part B: Content of the Course

Total No. of Lectures (in hours per week) : 3 hours per week

Total Lectures 90 hours

Unit	Topics	No. of Lectures
I	1.2 Historical background: 1.1.1. A brief historical background of the Algebra in the context of India and Indian heritage and culture 1.1.2 A brief biography of Brahmagupta 1.2 Groups, Subgroups and their basic properties 1.3 Cyclic groups 1.4 Coset decomposition 1.5 Lagrange's and Fermat's theorem 1.6 Normal subgroups 1.7 Quotient groups	18
II	2.1 Homomorphism and Isomorphism of groups 2.2 Fundamental theorem of homomorphism 2.3 Transformation and permutation group $S_n$ ( $n < 5$ ) 2.4 Cayley's theorem 2.5 Group automorphism 2.6 Inner automorphism 2.7 Group of automorphism	18
III	3.1 Definition and basic properties of ring 3.2 Ring homomorphism 3.3 Subring 3.4 Ideals 3.5 Quotient ring 3.6 Polynomial ring 3.7 Integral domain 3.8 Field	18
IV	4.1 Definition and examples of Vector space 4.2 Subspace 4.3 Sum and direct sum of subspace 4.4 Linear span, Linear dependence, linear independence and their basic properties 4.5 Basis	18

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	4.6 Finite dimensional vector space and dimension 4.6.1 Existence theorem 4.6.2 Extension theorem 4.6.3 Invariance of the number of elements 4.7 Dimension of sum of subspace 4.8 Quotient space and its dimension	
<b>V</b>	5.1 Linear transformation and its representation as a matrix 5.2 Algebra of linear transformation 5.3 Rank – Nullity theorem 5.4 Change of basic, dual space, bi – dual space and natural isomorphism 5.5 Adjoint of a linear transformation 5.6 Eigenvalues and Eigenvectors of a linear transformation 5.7 Diagonalization	<b>18</b>

**Keywords / Tags :**

Brahmagupta, Groups, Subgroups, Homomorphism and Isomorphism of groups, Ring, Ideals, Field, Vector space, Basis and dimension, Linear transformation, Diagonalisation.

**Part C – Learning Resources**

**Text Books, Reference Books, Other Resources**

**Suggest Readings:**

**Text Books:**

1. I. N. Herstein : Topics in Algebra, Wiley Eastern Ltd. New Delhi. 1977.
2. K. B. Datta: Matrix and Linear Algebra. Prentice Hall of India Pvt. Ltd. New Delhi 2000.
3. Gerard G. Emch, R. Sridharan, M.D. Srinivas: Contribution to the History of Indian Mathematics. Hindustan Book Agency, Vol.3, 2005.
4. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

**Reference Books:**

1. Surjeet Singh and Qazi Zameeruddin : Modern Algebra, Vikas Publishing House Pvt Ltd; Eighth edition, 2006.
2. N. Jacobson : Basic Algebra Vol. I and II, W. II Freeman, 1980.
3. I. S. Luther and I.B.S. Passi : Algebra Vol. I and II, Narosa Publishing House, 1997.
4. Shanti Narayan : A text Book of Modern Abstract Algebra, S. Chand and Company. New Delhi, 1967.
5. A. K. Vasishtha and A.R. Vasishtha : Modern Algebra, Krishna Publication; 68<sup>th</sup> edition, 2015.

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6. K. Hoffiman and R. Kunze: Linear Algebra. 2<sup>nd</sup> Edition, Prentice Hall Englewood Cliffs, New Jersey, 1971.
7. A.R. Vasishtha and J.N. Sharma: Linear Algebra, Krishna Prakashan Media (p) Ltd., 2019.
8. Bibhutibhusan Datta and Avadhesh Narayan Singh History of Hindu Mathematics.

**Suggested Digital Platforms Web links:**

<https://epgp.inflibnet.ac.in>

<https://www.highereducation.mp.gov.in?page=xhzlQmpZwkyIQo2b%2Fy5G7w%3D%3D>

<http://www.bhojvirtualuniversity.com>

**Suggested Equivalent online courses:**

<https://nptel.ac.in/courses/111/106/111106137/>

<https://nptel.ac.in/courses/111/105/111105112/><https://ugcmoocs.inflibnet.ac.in/index.php/courses/view/ug/32>

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Class	Subject	Year	Max. Marks	Credit Value	Course Code	Course Title
B.Sc.	Mathematics	II	30+70	6	S2-MATH2T (Major II/Minor/Elective)	Advanced Calculus and Partial Differential Equation

**Part B: Content of the Course**

**Total No. of Lectures (in hours per week) : 3 hours per week**

**Total Lectures 90 hours**

Unit	Topics	No. of Lectures
I	1.1 Historical background: 1.1.1. A brief historical background of Calculus and partial differential equations in the context of India and Indian heritage and culture 1.1.2 A brief biography of Bodhayana 1.2 Field structure and ordered structure of $R$ , intervals, bounded and unbounded sets, supremum and infimum, completeness in $R$ , absolute value of a real number. 1.3 Sequence of real numbers 1.4 Limit of a sequence 1.5 Bounded and monotonic sequences 1.6 Cauchy's general principle of convergence 1.7 Algebra of sequence and important theorems	18
II	2.1 Series of non – negative terms 2.2 Convergence of positive term series 2.3 Alternating series and Leibnitz's test 2.4 Absolute and Conditional Convergence of Series of real terms 2.5 Uniform continuity 2.6 Chain rule of differentiability 2.7 Mean value theorems and geometrical interpretations	18
III	3.1 Limit and continuity of functions of two variables 3.2 Change of variables 3.3 Euler's theorem on homogeneous functions 3.4 Taylor's theorem for functions of two variables 3.5 Jacobians 3.6 Maxima and Minima of functions of two variables 3.7 Lagrange's multiplier method 3.8 Beta and Gamma Functions	18
IV	4.1 Partial differential equations of first order 4.2 Lagrange's solution 4.3 Some special types of equations which can be solved easily by methods other than the general method 4.4 Charpit's general method 4.5 Partial differential equations of second and higher orders	18

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<b>V</b>	5.1 Classification of partial differential equations of second order 5.2 Homogeneous and non-homogeneous partial differential equations of constant coefficients 5.3 Partial differential equations reducible to equations with constant coefficients	<b>18</b>
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**Keywords / Tags :**

Bodhayana, Sequence, Series, Jacobians, Maxima and Minima, Beta and Gamma functions, partial differential equations.

**Part C – Learning Resources**

**Text Books, Reference Books, Other Resources**

**Suggest Readings:**

**Text Books:**

1. Devi Prasad : Advanced Calculus, Prentice Hall India Learning Private Limited, 2009.
2. S C Malik and savita Arora: Mathematical Analysis, New Age International Private Limited, 1<sup>st</sup> edition, 2017.
3. M.D. Raysinghania: Ordinary and Partial Differential Equations, S. Chanmd & Company, New Delhi, 2017.
4. Gerard G. Emch, R. Sridharan and M.D. Srinivas: Contributions to the History of Indian Mathematics. Hindustan Book Agency, Vol.3, 2005.
5. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

**Reference Books:**

1. R.R. Goldbeg: Methods of Real Analysis, Oxford & I.B.H. Publishing co. New Delhi, 2020.
2. T. M. Apostol: Mathematical Analysis, Narosa Publishing House. New Delhi. 1985.
3. D. Soma Sundaram and B. Choudhary : A first course in mathematical Analysis, Narosa Publishing, House, New Delhi, 1997.
4. Murray R. Spiegel: Theory and problems of advance Calculus, Schauma Publishing Co. NewYork, 1974.
5. Donald R. sherbert, Robert G. Bartle: Introduction to Real Analysis, Wiley, 4<sup>th</sup> edition, 2011.
6. Shah Nita H.: Ordinary and Partial Differential Equations: Theory and Applications, PHI Learning Private Limited, Second edition, 2015.
7. Gorakh Prasad: Integral Calculus, Pothishala Pvt. Allahabad, 2015.
8. K. Sankara Rao: Introduction to Partial Differential Equations, PHI, 3<sup>rd</sup> edition, 2010.
9. Bibhutibhushan Datta and Avadhesh Narayan Singh: History of Hindu Mathematics, Asia Publishing House, 1962.

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<http://www.bhojvirtualuniversity.com>

**Suggested Equivalent online courses:**

<https://nptel.ac.in/courses/111/104/111104125/>

<https://nptel.ac.in/courses/111/101/111101153/>

**Signature of Members of Board of Studies**

Dr. K. S. Bhatia

Dr. Geeta Shrivastava

Dr. Vijay Khare

Dr. Sudipta Sanyal

Dr. Manju Gupta

Dr. Kusumlata Rajak

Dr. Manoj Shukla

Dr. Anil Rajput

Dr. Mridula Dube

Dr. Mandira Kar

Dr. Archana Pasari

Dr. Vinit Jain

Dr. Nidhi Choubey

Head of the Department

Professor & Head

Department of Mathematics  
Govt. M.H. College of Home Science  
& Science for Women, Jabalpur

M. Dube  
Mandira Kar  
Archana Pasari  
25/07/2023

**Govt. M. H. College of Home Science & Science for Women (Autonomous) Jabalpur (M.P.)**  
**Department of Mathematics & Computer**  
**Session 2023 – 2024**

<b>Part A Introduction</b>			
<b>Program:</b> Degree Course	<b>Class:</b> B.Sc. III Year	<b>Year :</b> 2023	<b>Session :</b> 2023-2024
<b>Subject : Mathematics</b>			
1.	Course Code	<b>S3 –MATH1D</b>	
2.	Course Title	<b>Numerical Methods and Scientific Computation (Theory)</b>	
3.	Course Type	Discipline Specific Elective (DSE) (Group – A, Paper – I)	
4.	Pre-requisite (if any)	To study this course, a student must have the subject Mathematics in Diploma Course or equivalent.	
5.	Course Learning Outcomes (CLO)	The course will enable the students to: 1. Understand numerical methods to find the solution of a system of linear equations. 2. Compute interpolation value for real data. 3. Find quadrature by using various numerical methods. 4. Solve system of linear equations by using various numerical techniques. 5. Obtain solution of ordinary different equations by using numerical methods.	
6.	Credit Value	<b>Theory : 6 Credit</b>	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks : 35

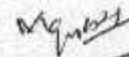
<b>Part B: Content of the Course</b>		
<b>Total No. of Lectures (in hours per week) : 3 hours per week</b>		
<b>Total Lectures : 90 hours</b>		
Unit	Topics	No. of Lectures
I	<b>Methods for Solving Algebraic and Transcendental Equations:</b> 1.1 Ramanujan 1.2 Bisection 1.3 Regula Falsi 1.4 Secant 1.5 Newton-Raphson	<b>18</b>

**Signature of Members of Board of Studies**

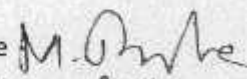
Dr. K. S. Bhatia



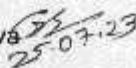
Dr. Manju Gupta



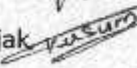
Dr. Mridula Dube



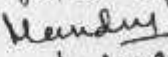
Dr. Geeta Shrivastava



Dr. Kusumlata Rajak



Dr. Mandira Kar

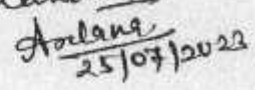


Dr. Vijay Khare

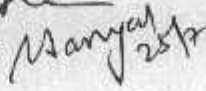


Dr. Manoj Shukla

Dr. Archana Pasari



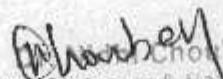
Dr. Sudipta Sanyal



Dr. Anil Rajput

Dr. Vinit Jain

**Academic Council  
Approved**

  
**Dr. Nidhi Choubey**  
 Head of the Department  
 Department of Mathematics  
 & Science for Women, Jabalpur

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**Department of Mathematics & Computer**  
**Session 2023 – 2024**


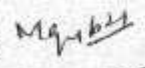
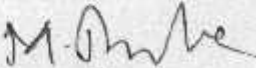
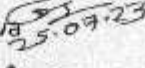

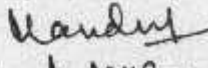
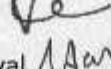
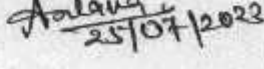
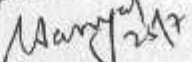
<b>II</b>	<b>Interpolation and Numerical Integration :</b> 2.1 Lagrange interpolation 2.2 Finite difference operators 2.3 Interpolation formula using Differences 2.3.1 Gregory – Newton Forward Difference Interpolation 2.3.2 Gregory – Newton Backward Difference Interpolation 2.4 Numerical Integration 2.4.1 Newton – Cote’s Formulae 2.4.2 Trapezoidal rule 2.4.3 Simpson’s 1/3 Rule 2.4.4 Simpson’s 3/8 Rule 2.4.5 Gauss Integration	<b>24</b>
<b>III</b>	<b>Methods to Solve System of Linear Equations:</b> 3.1 Direct method for solving system of linear equations 3.1.1 Gauss elimination 3.1.2 LU decomposition 3.1.3 Cholesky decomposition 3.2 Iterative method 3.2.1 Jacobi 3.2.2 Gauss-Seidel	<b>24</b>
<b>IV</b>	<b>Numerical Solution of Ordinary Differential Equations:</b> 4.1 Single step methods 4.1.1 Picard 4.1.2 Taylor’s series 4.1.3 Euler 4.1.4 Runge-Kutta 4.2 Multistep methods 4.2.1 Predictor-corrector 4.2.2 Modified Euler 4.2.3 Milne-Simpson	<b>24</b>

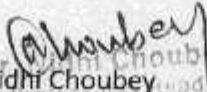
**Keywords/Tags:**

Algebraic and transcendental equation, Interpolation, Numerical Integration . Gauss elimination method, LU decomposition, Jacobi method. Gauss -Seidel method, Picard method, Runge –Kutta method, Predictor –corrector method, Milne –Simpson method.

**Remark: Scientific calculator will be allowed during examination.**

**Signature of Members of Board of Studies**

Dr. K. S. Bhatia 	Dr. Manju Gupta 	Dr. Mridula Dube 
Dr. Geeta Shrivastava 	Dr. Kusumlata Rajak 	Dr. Mandira Kar 
Dr. Vijay Khare 	Dr. Manoj Shukla	Dr. Archana Pasari 
Dr. Sudipta Sanyal 	Dr. Anil Rajput	Dr. Vinit Jain

  
**Dr. Nidhi Choubey**  
 Head of the Department  
 Dept. of Mathematics  
 Govt. M.H. College of Home Science  
 & Science for Women, Jabalpur

**Part C- Learning Resources**

Text Books, Reference Books, Other Resources

**Suggested Readings :**

**Text Books :**

1. S.S. Sastry : Introductory Methods of Numerical Analysis, Prentice Hall India Learning Private Limited, Fifth Edition, 2012.
2. E. Balagurusamy : Numerical Methods, Tata McGraw Hill publication, 2017.
3. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

**Reference Books:**

1. M. K. Jain, S.R. K. Iyengar, R. K. Jain, Numerical Method for Scientific and Engineering Computation, New Age International (P) Ltd., 1999.
2. Saxena H. C. Finite Differences & Numerical Analysis, S Chand, 2010.

**Suggested Digital Platforms Web links:**

<https://epgp.inflibnet.ac.in>

<https://www.eshiksha.mp.gov.in/mpdhe>

**Suggested Equivalent online courses:**

<https://nptel.ac.in/courses/111106101/>

<https://nptel.ac.in/courses/111107105/>

<https://nptel.ac.in/courses/111107107/>

[https://ugcmoocs.inflibnet.ac.in/index.php/courses/view\\_pg/1476](https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_pg/1476)

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25/07/2023

Dr. Sudipta Sanyal

  
25/7

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Head of the Department  
Govt. M. H. College of Home Science  
& Science for Women, Jabalpur



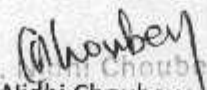
**Govt. M. H. College of Home Science & Science for Women (Autonomous) Jabalpur (M.P.)**  
**Department of Mathematics & Computer**

<b>Part A Introduction</b>			
<b>Program:</b> Degree Course	<b>Class:</b> B.Sc. III Year	<b>Year :</b> 2023	<b>Session :</b> 2023-2024
<b>Subject : Mathematics</b>			
1.	Course Code	<b>S3 –MATH2D</b>	
2.	Course Title	<b>Elements of Discrete Mathematics (Theory)</b>	
3.	Course Type	Discipline Specific Elective (DSE) (Group – A, Paper –II)	
4.	Pre-requisite (if any)	To study this course, a student must have the subject Mathematics in Diploma Course or equivalent.	
5.	Course Learning Outcomes (CLO)	The course will enable the students to: 1. Apply the Boolean algebra, switching circuits and their applications. 2. Minimize the Boolean Function using Karnaugh Map. 3. Understand the lattices and their types. 4. Graphs, their types and its applications in study of shortest path algorithms. 5. Test whether two given graphs are isomorphic. 6. Understand the Eulerian and Hamiltonian graphs. 7. Represent graphs using adjacency and incidence matrices.	
6.	Credit Value	<b>Theory : 6 Credit</b>	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks : 35

<b>Part B: Content of the Course</b>		
<b>Total No. of Lectures (in hours per week) : 3 hours per week</b>		
<b>Total Lectures : 90 hours</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>
1	1.1 Indian logic 1.1.1 Origins 1.1.2 The schools Vaisheshika 1.1.3 Catuskoti 1.1.4 Nyaya 1.1.5 Jain logic 1.1.6 Buddhist logic 1.1.7 Navya-Nyaya 1.1.8 Influence of Indian on modern logic 1.1.9 Boolean Logic and Indian Thoughts	18

**Signature of Members of Board of Studies**

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Dr. Geeta Shrivastava	Dr. Kusumlata Rajak	Dr. Mandira Kar
Dr. Vijay Khare	Dr. Manoj Shukla	Dr. Archana Pasari
Dr. Sudipta Sanyal	Dr. Anil Rajput	Dr. Vinit Jain

  
**Dr. Nidhi Choubey**  
**Head of the Department**  
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**Govt. M. H. College of Home Science & Science for Women (Autonomous) Jabalpur (M.P.)**  
**Department of Mathematics & Computer**  
**Session 2023 – 2024**

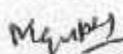
Unit	Topics	No. of Lectures
	1.2 Relations 1.2.1 Binary, Inverse Composite and Equivalence relation 1.2.2 Equivalence classes and its properties 1.2.3 Partition of a set 1.2.4 Partial order relation 1.2.5 Partially ordered and Totally ordered sets 1.2.6 Hasse diagram 1.3 Lattices 1.3.1 Definition and examples 1.3.2 Dual, bounded, distributive and complemented lattices	
II	2.1 Boolean Algebra 2.1.1 Definition and properties 2.1.2 Switching circuits and its applications 2.1.3 Logic gates and circuits 2.2 Boolean functions 2.2.1 Disjunctive and conjunctive normal forms 2.2.2 Bool's expansion theorem 2.3 Minimize the Boolean function using Karnaugh Map	24
III	<b>Graphs:</b> 3.1 Definition and types of graphs 3.2 Subgraphs 3.3 Walk, path and circuit 3.4 Connected and disconnected graphs 3.5 Euler graph 3.6 Hamiltonian path and circuit 3.7 Dijkstra's Algorithm for shortest paths in weighted graph	24

**Signature of Members of Board of Studies**

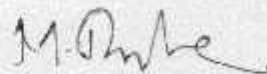
Dr. K. S. Bhatia



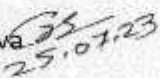
Dr. Manju Gupta



Dr. Mridula Dube



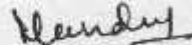
Dr. Geeta Shrivastava



Dr. Kusumlata Rajak



Dr. Mandira Kar

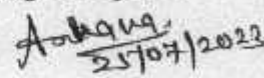


Dr. Vijay Khare

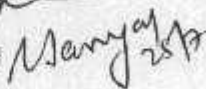


Dr. Manoj Shukla

Dr. Archana Pasari

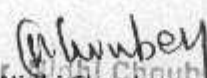


Dr. Sudipta Sanyal



Dr. Anil Rajput

Dr. Vinit Jain

  
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**Session 2023 – 2024**

IV	<p><b>Tree:</b></p> <p>4.1 Trees and its properties</p> <p>4.2 Rooted, Binary and Spanning tree</p> <p>4.3 Rank and nullity of a graph</p> <p>4.4 Kruskal's and Prim's Algorithm</p> <p>4.5 Cut-set and its properties'</p> <p>4.6 Fundamental Circuit and Cut-Set</p> <p>4.7 Planar graphs</p> <p>4.8 Kuratowski's two graphs</p> <p>4.9 Matrix representation of graphs</p> <p style="padding-left: 20px;">4.9.1 Incidence</p> <p style="padding-left: 20px;">4.9.2 Adjacency</p> <p style="padding-left: 20px;">4.9.3 Circuit</p> <p style="padding-left: 20px;">4.9.4 Cut-Set</p> <p style="padding-left: 20px;">4.9.5 Path</p>	24
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**Keywords/Tags:**

Relation, Hasse diagram, Lattices, Boolean Algebra, Boolean function, Graph and Subgraph, Path and Circuit, Tree, Spanning tree, Cut-set, Matrix representation of graph.

**Part C- Learning Resources**

**Text Books, Reference Books, Other Resources**

**Suggested Readings :**

**Text Books :**

1. J. P. Tremblay and R. Manohar, Discrete Mathematical Structure With Applications To Computer Science, McGraw Hill Education, 1st edition, 2017.
2. Satinder Bal Gupta, C.P. Gandhi : Discrete Structures, Laxmi Publication, 2010.
3. C.L. Liu: Elements of Discrete Mathematics, McGraw Hill Education, 4th edition, 2017.
4. Narsingh Deo: Graph Theory with Application to Engineering and Computer Science, Prentice Hall India Learning Private Limited, 1979.
3. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

**Reference Books:**

1. Seymour Lipschutz and Mark Lipson : Discrete Mathematics (Schaums Outline), McGraw Hill Education, 3rd edition, 2017.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, Pearson Education Pt. Ltd., Indian Reprint 2003.

**Suggested Digital Platforms Web links:**

<https://www.eshiksha.mp.gov.in/mpdhe>

**Suggested Equivalent online courses:**

<https://nptel.ac.in/courses/111106086/>

<https://ugcmoocs.inflibnet.ac.in/index.php/courses/view ug/311>

**Signature of Members of Board of Studies**

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Dr. Nidhi Choubey

Head of the Department


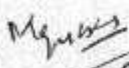

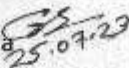
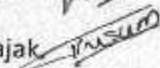
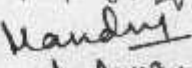
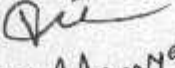
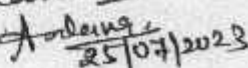
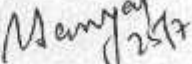
Department of Mathematics  
 Govt. M.H. College of Home Science  
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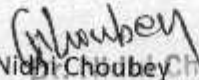
<b>Part A Introduction</b>			
<b>Program:</b> Degree Course	<b>Class:</b> B.Sc. III Year	<b>Year:</b> 2023	<b>Session:</b> 2023-2024
<b>Subject: Mathematics</b>			
1.	Course Code	<b>S3 -MATH2T</b>	
2.	Course Title	<b>Fundamental of Boolean Algebra (Theory)</b>	
3.	Course Type	Minor	
4.	Pre-requisite (if any)	To study this course, a student must have the subject Mathematics in Diploma Course or equivalent.	
5.	Course Learning Outcomes (CLO)	The course will enable the students : 1. Using the Boolean algebra in logical problems. 2. Minimize the Boolean Function using Karnaugh Map. 3. Understanding the various logic gates. 4. Applying the circuits in logical problems.	
6.	Credit Value	<b>Theory : 6 Credit</b>	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks : 35

<b>Part B: Content of the Course</b>		
<b>Total No. of Lectures (in hours per week) : 3 hours per week</b>		
<b>Total Lectures 90 hours</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>
<b>I</b>	1.1 Indian logic 1.1.1 Origins 1.1.2 The schools Vaisheshika 1.1.3 Catuskoti 1.1.4 Nyaya 1.1.5 Jain logic 1.1.6 Buddhist logic 1.1.7 Navya-Nyaya 1.1.8 Influence of Indian logic on modern logic 1.1.9 Boolean Logic and Indian Thoughts 1.2 Boolean Algebra: 1.2.1 Truth Tables 1.2.2 Properties of Boolean Algebra 1.2.3 Principle of Duality 1.2.4 De Morgan's Theorem	<b>18</b>

**Signature of Members of Board of Studies**

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Dr. Geeta Shrivastava  25.07.23	Dr. Kusumlata Rajak 	Dr. Mandira Kar 
Dr. Vijay Khare 	Dr. Manoj Shukla	Dr. Archana Pasari  25/07/2023
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**Academic Council  
Approved**

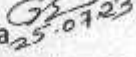
  
 Dr. Nidhi Choubey  
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**Session 2023 – 2024**

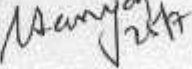
<b>Part B: Content of the Course</b>		
<b>Total No. of Lectures (in hours per week) : 3 hours per week</b>		
<b>Total Lectures 90 hours</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>
<b>II</b>	<b>Boolean Function :</b> 2.1 Boolean Expression 2.2 Boolean Function 2.3 Min-term or Minimal Boolean Function 2.4 Disjunctive Normal Form or Canonical Form 2.5 Complete Disjunctive Normal Form or Complete Canonical Form 2.6 Boole's Expansion Theorem 2.7 Complement Function of a Boolean Function in Disjunctive Normal Form 2.8 Max-term or Maximal Boolean Function 2.9 Conjunctive Normal Form or Dual Canonical Form 2.10 Complete Conjunctive Normal Form 2.11 Complement Function of a Boolean Function in Conjunctive Normal Form 2.12 SOP & POS Forms 2.13 Minimize the Boolean function using Karnaugh –Map upto 3 variables.	<b>30</b>
<b>III</b>	<b>Logic Gates:</b> 3.1 AND Gate 3.2 OR Gate 3.3 NOT Gate 3.4 NAND Gate 3.5 NOR Gate 3.6 XOR Gate 3.7 XNOR Gate 3.8 Buffer Gate 3.9 Universal Gate 3.10 Applications of Logic Gate	<b>18</b>

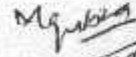
**Signature of Members of Board of Studies**

Dr. K. S. Bhatia 

Dr. Geeta Shrivastava  25/07/23

Dr. Vijay Khare 

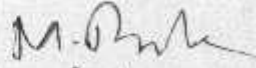
Dr. Sudipta Sanyal  25/7

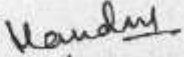
Dr. Manju Gupta 

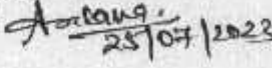
Dr. Kusumlata Rajak 

Dr. Manoj Shukla

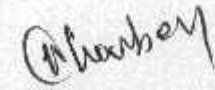
Dr. Anil Rajput

Dr. Mridula Dube 

Dr. Mandira Kar 

Dr. Archana Pasari  25/07/2023

Dr. Vinit Jain



Dr. Nidhi Choubey  
 Head of the Department  
 Professor & Head  
 Department of Mathematics  
 Govt. M. H. College of Home Science  
 & Science for Women, Jabalpur

**Govt. M. H. College of Home Science & Science for Women (Autonomous) Jabalpur (M.P.)**  
**Department of Mathematics & Computer**  
**Session 2023 – 2024**

<b>IV</b>	<b>Circuits :</b> 4.1 Switching Circuits 4.2 Parallel Circuits 4.3 Series Circuits 4.4 Relay Circuits 4.5 Various Positions of Switches and Currents in Electric Circuits 4.6 Simple Arithmetic and Logic Circuits 4.7 Combinational Circuits 4.7.1 Adder 4.7.2 Subtractor 4.8 Simple Combinational Circuit Design Problem	<b>24</b>
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**Keywords/Tags:**

Boolean Algebra, Boolean function, Logic Gates, Logic Circuits.

**Part C- Learning Resources**

Text Books, Reference Books, Other Resources

**Suggested Readings :**

**Text Books :**

1. J.P. Tremblay and R. Manohar , Discrete Mathematical Structures With Applications To Computer Science, McGraw Hill Education, 1st edition, 2017.
2. C.L. Liu: Elements of Discrete of Discrete Mathematics, McGraw Hill Education, 4th edition, 2017.
3. Elliott Mendelson: Boolean Algebra and Switching Circuits, McGraw Hill, 2020.
4. Satinder Bal Gupta, C. P. Gandhi: Discrete Structures, Laxmi Publication, 2010.
5. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

**Reference Books:**

1. Seymour Lipschutz and Mark Lipson: Discrete Mathematics (Schaums Outline), McGraw Hill Education, 3rd edition, 2017.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory. Pearson Education Pt.Ltd., Indian Reprint 2003.

**Suggested Digital Platform Web links:**


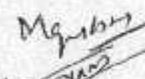
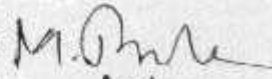
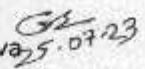

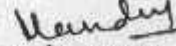
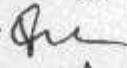
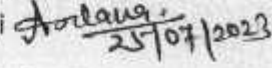
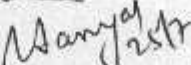
<https://www.eshiksha.mp.gov.in/mpdhe>

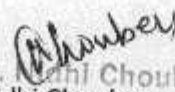
Suggested Equivalent online courses:

<https://nptel.ac.in/courses/111106086/>

[https://88ugcmoocs.inflibnet.ac.in/index.php/courses/view\\_ug/311](https://88ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/311)

**Signature of Members of Board of Studies**

Dr. K. S. Bhatia 	Dr. Manju Gupta 	Dr. Mridula Dube 
Dr. Geeta Shrivastava  25.07.23	Dr. Kusumlata Rajak 	Dr. Mandira Kar 
Dr. Vijay Khare 	Dr. Manoj Shukla	Dr. Archana Pasari  25/07/2023
Dr. Sudipta Sanyal 	Dr. Anil Rajput	Dr. Vinit Jain

  
**Dr. Nidhi Choubey**  
 Head of the Department  
 Govt. M.H. College of Home Science  
 & Science for Women, Jabalpur

Part A Introduction			
Program: Degree Course	Class: B.A./B.Sc. III Year	Year: 2023	Session: 2023-2024
Subject: Mathematics			
1	Course Code	S3-MATH3D	
2	Course Title	Probability and Statistics (Theory)	
3	Course Type	Discipline Specific Elective (DSE) (Group-B, Paper-I)	
4	Pre-requisite (if any)	To study this course, a student must have had the subject Mathematics in Diploma Course or equivalent.	
5	Course Learning Outcomes (CLO)	This course will enable the students to: <ol style="list-style-type: none"> <li>1. Describe and calculate the mean deviation, standard deviation, range, quartiles and percentiles.</li> <li>2. Understand and use the terminology of probability.</li> <li>3. Determine whether two events are mutually exclusive and independent.</li> <li>4. Calculate probabilities using the addition and multiplication rules.</li> <li>5. Recognize and understand discrete and continuous probability distribution functions, binomial, uniform and exponential probability distribution.</li> <li>6. Calculate and interpret the correlation coefficient.</li> <li>7. Understand the basic concepts of linear regression and correlation.</li> <li>8. Interpret the Student's t probability distribution, chi-square goodness-of-fit, F and Z test.</li> </ol>	
6	Credit Value	Theory: 6 Credit	
7	Total Marks	Max. Marks: 30 + 70	Min. Passing Marks: 35

Part B - Content of the Course		
Total No. of Lectures (in hours per week): 2 hours per week		
Total Lectures: 60 hours		
Unit	Topics	No. of Lectures
1	1.1 Indian Contributions in Statistics: 1.1.1 P. C. Mahalanobis 1.1.2 C. Radhakrishna Rao 1.1.3 Samanta Chandra Sekhar Harichandan 1.1.4 J. K. Ghose 1.1.5 P. Maiti 1.2 Theory of Probability: 1.2.1 Event and Sample space 1.2.2 Probability of an event 1.2.3 Addition and multiplication theorem of probability 1.2.4 Inverse probability 1.2.5 Baye's theorem	24

Name of BOS: Mathematics

Date: 25/07/2023

Signature of the Chairman (BOS):

Name: Dr. Anil Rajput

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Dr. Anil Rajput  
 Professor & Head  
 Department of Mathematics  
 Govt. Noida College of Home Science  
 & Science for Women, Jalandhar

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	1.2.6 Continuous probability 1.2.7 Probability density function and its applications 1.2.8 Standard deviation of various continuous probability distributions 1.2.9 Mathematical expectation 1.2.10 Expectation of sum and product of random variables	
II	<b>Dispersion and Distribution:</b> 2.1 Measures of dispersion 2.1.1 Range and interquartile range 2.1.2 Mean deviation and Standard deviation 2.1.3 Moments, Skewness and kurtosis 2.2 Moment generating function 2.3 Theoretical distribution with their properties and uses 2.3.1 Binomial 2.3.2 Poisson 2.3.3 Rectangular 2.3.4 Exponential	24
III	<b>Curve fitting and Correlation:</b> 3.1 Methods of least squares 3.2 Curve fitting 3.3 Correlation and regression 3.4 Partial and multiple correlations (up to three variables only)	18
IV	<b>Sampling:</b> 4.1 Sampling of large samples 4.2 Null and alternative hypothesis 4.3 Errors of first and second kinds 4.4 Level of significance and critical region 4.5 Tests of significance based on chi-square ( $\chi^2$ ), t, F and Z distribution	24
<b>Keywords/Tags:</b> Probability, Dispersion, Moment generating function, Theoretical distribution, Curve fitting, Correlation, Regression, Sampling.		
<b>Remark:</b> Scientific calculator will be allowed during examination.		

**Part C - Learning Resources**

Text Books, Reference Books, Other Resources

**Suggested Readings:****Text Books:**

1. H. C. Saxena and J. N. Kapoor: Mathematical Statistics, S. Chand and Company, 2010.
2. E. Rukmangadachari: Probability and Statistics, Pearson Education India: First edition, 2012.
3. M. Ray, Har Swarup Sharma, S. S Chaudhary: Mathematical Statistics, Ram Prasad Publication, 2022.
4. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Name of BOS: Mathematics

Date: 25.07.2023

Academic Council  
Approved

Signature of the Chairman (BOS)

Name: Dr. Anil Rajput

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Mg. Jaisurya

Jaisurya

Dr. Nidhi Choubey

Professor &amp; Head

Department of Mathematics  
Govt. M.H. College of Home Science  
& Science for Women, Jabalpur

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**Reference Books:**

1. Vijay K. Rohatgi, A. K. Md. Ehsanes Saleh: An Introduction to Probability and Statistics, Wiley; 3rd edition, 2015.
2. S. C. Gupta and V. K. Kapoor: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, 2014.

**Suggested Digital Platforms Web links:**

<https://www.eshiksha.mp.gov.in/mpdhe>

**Suggested Equivalent online courses:**

<https://nptel.ac.in/courses/111106112/>

<https://nptel.ac.in/courses/111105090/>

[https://ugcmooes.inflibnet.ac.in/index.php/courses/view\\_ug/313](https://ugcmooes.inflibnet.ac.in/index.php/courses/view_ug/313)

[https://ugcmooes.inflibnet.ac.in/index.php/courses/view\\_ug/327](https://ugcmooes.inflibnet.ac.in/index.php/courses/view_ug/327)

**Part D: Assessment and Evaluation****Suggested Continuous Evaluation Methods:**

Maximum Marks:	100
Continuous Comprehensive Evaluation (CCE):	30 Marks
University Exam (UE):	70 Marks

**Internal Assessment:**

Continuous Comprehensive Evaluation (CCE)

Total Marks: 30

**External Assessment:**

University Exam (UE)

Total Marks: 70

Name of BOS: Mathematics

Date: 25.07.2022

Signature of the Chairman (BOS)

Name: Dr. Anil Rajput

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25.07.23

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25/7

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Dr. Anil Rajput  
Professor & Head  
Department of Mathematics  
Govt. M.H. College of Basic Science  
& Science for Women, Jabalpur

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25/07/2022

Part A Introduction			
Program: Degree Course	Class: B.A./B.Sc. III Year	Year: 2023	Session: 2023-2024
Subject: Mathematics			
1	Course Code	S3-MATH4D	
2	Course Title	Integral Transform (Theory)	
3	Course Type	Discipline Specific Elective (DSE) (Group-B, Paper-II)	
4	Pre-requisite (if any)	To study this course, a student must have had the subject Mathematics in Diploma Course or equivalent.	
5	Course Learning Outcomes (CLO)	The course will enable the students: 1. Understanding about Laplace transform and its properties. 2. Solve ordinary differential equations using Laplace transform. 3. Familiarise with Fourier transform of functions, relation between Laplace and Fourier transform. 4. Explain Parseval's identity and applications of Fourier transform to boundary value problems. 5. Apply the concepts of the course in real life problems.	
6	Credit Value	Theory: 6 Credit	
7	Total Marks	Max. Marks: 30 + 70	Min. Passing Marks: 35

Part B - Content of the Course		
Total No. of Lectures (in hours per week): 3 hours per week		
Total Lectures: 90 hours		
Unit	Topics	No. of Lectures
I	<b>Laplace Transform:</b> 1.1 Linearity property 1.2 Existence theorem 1.3 Shifting theorem 1.4 Change of scale property 1.5 Laplace transforms of derivatives and integrals 1.6 Differentiation and integration of the Laplace transforms 1.7 Multiplication and division by 't' 1.8 Periodic function	25
II	<b>Inverse Laplace Transform:</b> 2.1 Linearity property 2.2 Shifting theorem 2.3 Change of scale property 2.4 Inverse Laplace transforms of derivatives and integrals 2.5 Multiplication and division by powers of p 2.6 Convolution theorem 2.7 Heaviside expansion theorem	25
III	<b>Application of Laplace Transform:</b> 3.1 Solution of ordinary differential equations with constant coefficients 3.2 Solution of ordinary differential equations with variable coefficients	15

Name of BOS: Mathematics

Date: 22.11.2022

Signature of the Chairman (BOS):

Name: Dr. Anil Rajput

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25.07.23

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*[Signature]*  
25/7

*[Signature]*

Dr. Nidhi Choudhary  
Prof. & Head  
Dept. of Mathematics  
Govt. College of Home Science  
& Science for Women, Jabalpur

*[Signature]*  
25/07/2023

IV	<b>Fourier Transform:</b>	25
	4.1 Linearity property	
	4.2 Shifting theorem	
	4.3 Change of scale property	
	4.4 Modulation	
	4.5 Convolution theorem	
	4.6 Fourier transform of derivatives	
	4.7 Relations between Fourier transform and Laplace transform	
	4.8 Parseval's identity for Fourier transform	
	4.9 Solution of differential equations using Fourier transform	
<b>Keywords/Tags:</b> Laplace Transform, Inverse Laplace transform, Fourier Transform, Linearity Property, Change of Scale Property, Shifting theorem, Convolution theorem.		

**Part C - Learning Resources**

Text Books, Reference Books, Other Resources

**Suggested Readings:****Text Books:**

1. Lokenath Debnath, Dambaru Bhatta: Integral Transforms and Their Applications, Chapman and Hall/CRC; 3rd edition, 2014.
2. Sreenadh S., Ranganatham S., Prasad M.V.S.S.N. & Babu, Ramesh V.: Fourier Series and Integral Transforms, S. Chand Publishing, 2014.
3. A. N. Srivastava: Integral Transforms And Fourier Series, Narosa Publications, 2012.
4. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

**Reference Books:**

1. I. N. Sneddon: The use of integral transform, McGraw Hill, 1972.
2. Murray R. Spiegel, Laplace transform, Schaum's Series, McGraw-Hill Education, 1st edition, 1965.

**Suggested Digital Platforms Web links:**<https://epgp.inflibnet.ac.in><https://www.eshiksha.mp.gov.in/mpdhe>**Suggested Equivalent online courses:**<https://nptel.ac.in/courses/111/102/111102129/>**Part D: Assessment and Evaluation****Suggested Continuous Evaluation Methods:**

Maximum Marks:	100
Continuous Comprehensive Evaluation (CCE):	30 Marks
University Exam (UE):	70 Marks

**Internal Assessment:**

Continuous Comprehensive Evaluation (CCE)

**Total Marks: 30****External Assessment:**

University Exam (UE)

**Total Marks: 70**

Name of BOS: Mathematics

Date: 25/07/2023

Signature of the Chairman (BOS):

Name: Dr. Anil Rajput

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*Dr. Anil Rajput*  
25/07/23

*Dr. Anil Rajput*  
25/7

*Dr. Anil Rajput*  
25/07/2023

*Dr. Anil Rajput*  
25/07/2023

Dr. Nidhi Chandra  
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Department of Mathematics  
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& Centre for Women, Jabalpur  
25/07/2023