



# **A.S.D. Government Degree College for Women** **An Autonomous Institution**

**Jagannaickpur, Kakinada, Andhra Pradesh-533002**  
**Affiliated to Adikavi Nannaya University, Rajamahendravaram**



## **INTERNAL QUALITY ASSURANCE CELL**

**2.6.1. The institution has stated learning outcomes (programme and course outcome)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents and the attainment of the same are evaluated by the institution.**

### **MATHEMATICS**

### **COURSE OUTCOMES**

**(2018-23)**

A.S.D.GOVERNMENT DEGREE COLLEGE FOR WOMEN  
AUTONOMOUS ,KAKINADA



DEPARTMENT OF MATHEMATICS

COURSE OUTCOMES

2018-19 TO 2022-23

A.S.D.GOV.T.DEGREE COLLEGE FOR WOMEN (A)

Department of Mathematics

PROGRAMME: B.Sc(MPC, MPCs)

2018-19

## **COURSE OUTCOMES**

**Paper : I**

**Course: Differential Equations**

**Course Outcomes:**

CO 1. solve first order first degree linear differential equations.

CO 2. convert a non-exact homogeneous equation to exact differential equation by using an integrating factor

CO3. know the methods of finding solution of a differential equation of first order but not of first degree

CO4. solve higher-order linear differential equations for both homogeneous and non-homogeneous, with constant coefficients.

CO5. understand and apply the appropriate methods for solving higher order differential equations

**Paper :II**

**Course : THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY**

**Course Outcomes:**

CO 1. understand planes and system of planes.

CO 2. know the detailed idea of lines.

CO 3. understand spheres and their properties.

CO4. know system of spheres and coaxial system of spheres.

CO 5. understand various types of cones.

### **Paper :III**

#### **Course: ABSTRACT ALGEBRA**

##### **Course Outcomes:**

- CO 1. To analyse the abstract algebraic concept Group theory.
- CO 2. To understand the concepts in group theory like groups, subgroups, normal subgroups, permutation groups and cyclic groups with examples.
- CO 3. To understand the theorems on these concepts and also to solve problems on it.
- CO 4. To analyse and understand the applications of group theory in various fields.
- CO 5. To understand the ring theoretic concepts with the help of knowledge in group theory and to prove the theorems on it.
- CO 6. To understand the applications of ring theory in various fields

### **Paper :IV**

#### **Course: REAL ANALYSIS**

##### **Course Outcomes:**

- CO 1. To get clear idea about the real numbers and real valued functions.
- CO 2. To obtain the skills of analyzing the concepts and applying appropriate methods for testing converges of a sequence or series.
- CO 3. To analyse the concepts of continuity, differentiability and Riemann integrability of a function and also to gain the skills about how to test these conditions of functions defined on the subsets of the realline.
- CO4. To know the Geometrical interpretation of mean value theorems.

### **Paper :V**

#### **Course: RING THEORY&VECTOR CALCULUS**

##### **Course Outcomes:**

- CO1. Understand the importance of algebraic properties with regards to working with in various number systems
- CO2. Develop skills to analyze, improve and outline the logical thinking .interpret how to know the ring theory using internet.
- CO3. Use relevant numerical techniques to determine ,and apply , the important quantities associated with vector fields such as the divergence,curl,and scaler potential
- CO4. Develop numerical skills in solving the problems involveing evaluate line integrals solve line and surface intergarals.evaluate double and triple integrals in eclidean,cylindrical and spherical coordinate systems.
- CO5. Evaluate integral using greens thorem ,stock theorem and gauss divergence theorem.

**Paper :VI**

**Course: LINEAR ALGEBRA**

**Course Outcomes:**

- CO 1. To understand the different concepts of linear algebra.
- CO 2. To analyse the concepts of vector space, subspace and homomorphism between them.
- CO 3. To understand how to solve the system of linear equations and this concept used in balancing of chemical equations.
- CO 4. To analyse the concepts of eigen values, inner product spaces and orthogonality and also gain the problem solving ability on them

**Paper :VIA**

**Course: NUMERICAL METHODS**

**Course Outcomes:**

- CO 1. Understand the subject of various numerical methods that are used to obtain approximate solutions .
- CO 2. Understand various finite difference concepts and interpolation methods.
- CO 3. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
- CO 4. Find numerical solutions of ordinary differential equations by using various numerical methods.
- CO 5. Analyze and evaluate the accuracy of numerical methods.

**Paper :VIA**

**Course: ADVANCE NUMERICAL METHODS**

**Course Outcomes:**

- CO 1** : be able to derive numerical methods for various mathematical operations and tasks, such as interpolation using differentiation.
- CO 2** : be able to solve problems using Simpson's rule , trapezoidal rule which involve integration. for various mathematical operations and tasks.
- CO 3** : analyze various methods to solve exponential , power series curves
- CO 4** : Acquire knowledge on solving simultaneous linear system of equations using direct and iterative methods.
- CO 5** : Acquire knowledge on solving Ordinary Differential Equations using different numerical methods

**Paper :VII B**

**Course: MATHEMATICS SPECIAL FUNCTIONS**

**Course Outcomes:**

CO 1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations

CO 2. Find power series solutions of ordinary differential equations.

CO 3. solve Hermite equation and write the Hermite Polynomial of order (degree)  $n$ , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.

CO 4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials.

CO 5. Solve Bessel equation and write the Bessel equation of first kind of order  $n$ , also find the generating function for Bessel function understand the orthogonal properties of Bessel unction.

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A.S.D.GOV.T.DEGREE COLLEGE FOR WOMEN (A)

Department of Mathematics

PROGRAMME:B.Sc(MPC,MPCs)

2019-20

## **COURSE OUTCOMES**

**Paper : I**

**Course: Differential Equations**

**Course Outcomes:**

CO 1. solve first order first degree linear differential equations.

CO 2. convert a non-exact homogeneous equation to exact differential equation by using an integrating factor

CO3.know the methods of finding solution of a differential equation of first order but not of first degree

CO4. solve higher-order linear differential equations for both homogeneous and non-homogeneous, with constant coefficients.

CO5.understand and apply the appropriate methods for solving higher order differential equations

**Paper :II**

**Course:THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY**

**Course Outcomes:**

CO 1. understand planes and system of planes.

CO 2. know the detailed idea of lines.

CO 3. understand spheres and their properties.

CO4. know system of spheres and coaxial system of spheres.

CO 5. understand various types of cones.

**Paper :III****Course: ABSTRACT ALGEBRA****Course Outcomes:**

- CO 1. To analyse the abstract algebraic concept Group theory.
- CO 2. To understand the concepts in group theory like groups, subgroups, normal subgroups, permutation groups and cyclic groups with examples.
- CO 3. To understand the theorems on these concepts and also to solve problems on it.
- CO 4. To analyse and understand the applications of group theory in various fields.
- CO 5. To understand the ring theoretic concepts with the help of knowledge in group theory and to prove the theorems on it.
- CO 6. To understand the applications of ring theory in various fields

**Paper :IV****Course: REAL ANALYSIS****Course Outcomes:**

- CO 1. To get clear idea about the real numbers and real valued functions.
- CO 2. To obtain the skills of analyzing the concepts and applying appropriate methods for testing converges of a sequence or series.
- CO 3. To analyse the concepts of continuity, differentiability and Riemann integrability of a function and also to gain the skills about how to test these conditions of functions defined on the subsets of the realline.
  
- CO4. To know the Geometrical interpretation of mean value theorems.



**Paper :V**

**Course: RING THEORY&VECTOR CALCULUS**

**Course Outcomes:**

CO1. Understand the importance of algebraic properties with regards to working with in various number systems

CO2. Develop skills to analyze, improve and outline the logical thinking .interpret how to know the ring theory using internet.

CO3. Use relevant numerical techniques to determine ,and apply , the important quantities associated with vector fields such as the divergence,curl,and scaler potential

CO4. Develop numerical skills in solving the problems involveing evaluate line integrals solve line and surface intergarals.evaluate double and triple integrals in eclidean,cylindrical and spherical coordinate systems.

CO5. Evaluate integral using greens thorem ,stock theorem and gauss divergence theorem.

**Paper :VI**

**Course: LINEAR ALGEBRA**

**Course Outcomes:**

CO 1. To understand the different concepts of linear algebra.

CO 2. To analyse the concepts of vector space, subspace and homomorphism between them.

CO 3. To understand how to solve the system of linear equations and this concept used in balancing of chemical equations.

CO 4. To analyse the concepts of eigen values, inner product spaces and orthogonality and also gain the problem solving ability on them

**Paper :VIA**

**Course: NUMERICAL METHODS**

**Course Outcomes:**

CO 1. Understand the subject of various numerical methods that are used to obtain approximate solutions .

CO 2. Understand various finite difference concepts and interpolation methods.

CO 3. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.

CO 4. Find numerical solutions of ordinary differential equations by using various numerical methods.

CO 5. Analyze and evaluate the accuracy of numerical methods.

**Paper :VIA**

**Course: ADVANCE NUMERICAL METHODS**

**Course Outcomes:**

**CO 1 :** be able to derive numerical methods for various mathematical operations and tasks, such

as interpolation using differentiation.

**CO 2 :** be able to solve problems using Simpson's rule , trapezoidal rule which involve integration. for various mathematical operations and tasks.

**CO 3 :** analyze various methods to solve exponential , power series curves

**CO 4 :** Acquire knowledge on solving simultaneous linear system of equations using direct and iterative methods.

**CO 5 :** Acquire knowledge on solving Ordinary Differential Equations using different numerical methods

**Paper :VIIB**

**Course: MATHEMATICS SPECIAL FUNCTIONS**

**Course Outcomes:**

CO 1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations

CO 2. Find power series solutions of ordinary differential equations.

CO 3. solve Hermite equation and write the Hermite Polynomial of order (degree)  $n$ , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.

CO 4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials.

CO 5. Solve Bessel equation and write the Bessel equation of first kind of order  $n$ , also find the generating function for Bessel function understand the orthogonal properties of Bessel unction.

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# A.S.D.GOV.T.DEGREE COLLEGE FOR WOMEN (A)

Department of Mathematics

PROGRAMME: B.Sc(MPC, MPCs)

2020-21

## COURSE OUTCOMES

### **Paper : I**

#### **Course: Differential Equations**

#### **Course Outcomes:**

CO 1. solve first order first degree linear differential equations.

CO 2. convert a non-exact homogeneous equation to exact differential equation by using an integrating factor

CO3. know the methods of finding solution of a differential equation of first order but not of first degree

CO4. solve higher-order linear differential equations for both homogeneous and non-homogeneous, with constant coefficients.

CO5. understand and apply the appropriate methods for solving higher order differential equations

### **Paper :II**

#### **Course: THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY**

#### **Course Outcomes:**

CO 1. understand planes and system of planes. planes.

CO 2. know the detailed idea of lines.

CO 3. understand spheres and their properties.

CO4. know system of spheres and coaxial system of spheres.

CO 5. understand various types of cones.

**Paper :III****Course: ABSTRACT ALGEBRA****Course Outcomes:**

- CO 1. To analyse the abstract algebraic concept Group theory.
- CO 2. To understand the concepts in group theory like groups, subgroups, normal subgroups, permutation groups and cyclic groups with examples.
- CO 3. To understand the theorems on these concepts and also to solve problems on it.
- CO 4. To analyse and understand the applications of group theory in various fields.
- CO 5. To understand the ring theoretic concepts with the help of knowledge in group theory and to prove the theorems on it.
- CO 6. To understand the applications of ring theory in various fields

**Paper :III****Course: ANALYTICAL SKILLS****Course Outcomes:**

1. Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.
2. Acquire competency in the use of verbal reasoning.
3. Apply the skills and competencies acquired in the related areas
4. Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

**Paper :IV****Course: REAL ANALYSIS****Course Outcomes:**

- CO 1. To get clear idea about the real numbers and real valued functions.
- CO 2. To obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence or series.
- CO 3. To analyse the concepts of continuity, differentiability and Riemann integrability of a function and also to gain the skills about how to test these conditions of functions defined on the subsets of the real line.
- CO 4. To know the Geometrical interpretation of mean value theorems.

**Paper :V****Course: RING THEORY&VECTOR CALCULUS****Course Outcomes**

CO1. Understand the importance of algebraic properties with regards to working with in various number systems

CO2. Develop skills to analyze, improve and outline the logical thinking .interpret how to know the ring theory using internet.

CO3. Use relevant numerical techniques to determine ,and apply , the important quantities associated with vector fields such as the divergence,curl,and scalar potential

CO4. Develop numerical skills in solving the problems involveing evaluate line integrals solve line and surface intergarals.evaluate double and triple integrals in eclidean,cylindrical and spherical coordinate systems.

CO5. Evaluate integral using greens thorem ,stock theorem and gauss divergence theorem.

**Paper :VI****Course: LINEAR ALGEBRA****Course Outcomes:**

CO 1. To understand the different concepts of linear algebra.

CO 2. To analyse the concepts of vector space, subspace and homomorphism between them.

CO 3. To understand how to solve the system of linear equations and this concept used in balancing of chemical equations.

CO 4. To analyse the concepts of eigen values, inner product spaces and orthogonality and also gain the problem solving ability on them

**Paper :VIA****Course: NUMERICAL METHODS****Course Outcomes:**

CO 1. Understand the subject of various numerical methods that are used to obtain approximate solutions .

CO 2. Understand various finite difference concepts and interpolation methods.

CO 3. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.

CO 4. Find numerical solutions of ordinary differential equations by using various numerical methods.

CO 5. Analyze and evaluate the accuracy of numerical methods.

**Paper :VIA**

**Course: ADVANCE NUMERICAL METHODS**

**Course Outcomes:**

**CO 1 :** be able to derive numerical methods for various mathematical operations and tasks, such

as interpolation using differentiation.

**CO 2 :** be able to solve problems using Simpson's rule , trapezoidal rule which involve integration. for various mathematical operations and tasks.

**CO 3 :** analyze various methods to solve exponential , power series curves

**CO 4 :** Acquire knowledge on solving simultaneous linear system of equations using direct and iterative methods.

**CO 5 :** Acquire knowledge on solving Ordinary Differential Equations using different numerical methods

**Paper :VIIB**

**Course: MATHEMATICS SPECIAL FUNCTIONS**

**Course Outcomes:**

CO 1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations

CO 2. Find power series solutions of ordinary differential equations.

CO 3. solve Hermite equation and write the Hermite Polynomial of order (degree)  $n$ , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.

CO 4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials.

CO 5. Solve Bessel equation and write the Bessel equation of first kind of order  $n$ , also find the generating function for Bessel function understand the orthogonal properties of Bessel unction.

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# A.S.D.GOV.T.DEGREE COLLEGE FOR WOMEN (A)

Department of Mathematics

PROGRAMME: B.Sc(MPC, MPCs)

2021-22

## COURSE OUTCOMES

**Paper : I**

**Course: Differential Equations**

**Course Outcomes:**

CO 1. solve first order first degree linear differential equations.

CO 2. convert a non-exact homogeneous equation to exact differential equation by using an integrating factor

CO3. know the methods of finding solution of a differential equation of first order but not of first degree

CO4. solve higher-order linear differential equations for both homogeneous and non-homogeneous, with constant coefficients.

CO5. understand and apply the appropriate methods for solving higher order differential equations

**Paper :II**

**Course: THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY**

**Course Outcomes:**

CO 1. understand planes and system of planes.

CO 2. know the detailed idea of lines.

CO 3. understand spheres and their properties.

CO4. know system of spheres and coaxial system of spheres.

CO 5. understand various types of cones.



**Paper :III**

**Course: ABSTRACT ALGEBRA**

**Course Outcomes:**

CO 1. To analyse the abstract algebraic concept Group theory.

CO 2. To understand the concepts in group theory like groups, subgroups, normal subgroups, permutation groups and cyclic groups with examples.

CO 3. To understand the theorems on these concepts and also to solve problems on it.

CO 4. To analyse and understand the applications of group theory in various fields.

CO 5. To understand the ring theoretic concepts with the help of knowledge in group theory and to prove the theorems on it.

CO 6. To understand the applications of ring theory in various fields

**Paper :III**

**Course: ANALYTICAL SKILLS**

**Course Outcomes:**

1. Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.

2. Acquire competency in the use of verbal reasoning.

3. Apply the skills and competencies acquired in the related areas

4. Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

**Paper :IV**

**Course: REAL ANALYSIS**

**Course Outcomes:**

CO 1. To get clear idea about the real numbers and real valued functions.

CO 2. To obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence or series.

CO 3. To analyse the concepts of continuity, differentiability and Riemann integrability of a function and also to gain the skills about how to test these conditions of functions defined on the subsets of the real line.

CO4. To know the Geometrical interpretation of mean value theorems.

**Paper :IV**

**Course: LINEAR ALGEBRA**

**Course Outcomes:**

1. Understand the concepts of vector space , subspace ,basis , dimension and their properties
2. Understand the concepts of linear transformations and their properties
3. Apply Cayley –Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine method
4. Learn the properties of inner product spaces and determine orthogonality in inner product spaces

**Paper :V**

**Course: LINEAR ALGEBRA**

**Course Outcomes:**

- CO 1. To understand the different concepts of linear algebra.
- CO 2. To analyse the concepts of vector space, subspace and homomorphism between them.
- CO 3. To understand how to solve the system of linear equations and this concept used in balancing of chemical equations.
- CO 4. To analyse the concepts of eigen values, inner product spaces and orthogonality and also gain the problem solving ability on them

**Paper :V**

**Course: RING THEORY**

**Course Outcomes:**

CO1. Understand the importance of algebraic properties with regards to working with in various number systems

CO2. Develop skills to analyze, improve and outline the logical thinking .interpret how to know the ring theory using internet.

CO3. Use relevant numerical techniques to determine ,and apply , the important quantities associated with vector fields such as the divergence,curl,and scaler potential

CO4. Develop numerical skills in solving the problems involveing evaluate line integrals solve line and surface intergarals.evaluate double and triple integrals in eclidean,cylindrical and spherical coordinate systems.

CO5. Evaluate integral using greens thorem ,stock theorem and gauss divergence theorem.

**Paper :**

**Paper :VIA**

**Course: NUMERICAL METHODS**

**Course Outcomes:**

CO 1. Understand the subject of various numerical methods that are used to obtain approximate solutions .

CO 2. Understand various finite difference concepts and interpolation methods.

CO 3. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.

CO 4. Find numerical solutions of ordinary differential equations by using various numerical methods.

CO 5. Analyze and evaluate the accuracy of numerical methods.

**Paper :VIIA**

**Course: ADVANCE NUMERICAL METHODS**

**Course Outcomes:**

**CO 1 :** be able to derive numerical methods for various mathematical operations and tasks, such as interpolation using differentiation.

**CO 2 :** be able to solve problems using Simpson's rule , trapezoidal rule which involve integration. for various mathematical operations and tasks.

**CO 3 :** analyze various methods to solve exponential , power series curves

**CO 4 :** Acquire knowledge on solving simultaneous linear system of equations using direct and iterative methods.

**CO 5 :** Acquire knowledge on solving Ordinary Differential Equations using different numerical methods

**Paper :VIIB**

**Course: MATHEMATICS SPECIAL FUNCTIONS**

**Course Outcomes:**

CO 1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations

CO 2. Find power series solutions of ordinary differential equations.

CO 3. solve Hermite equation and write the Hermite Polynomial of order (degree)  $n$ , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.

CO 4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials.

CO 5. Solve Bessel equation and write the Bessel equation of first kind of order  $n$ , also find the generating function for Bessel function understand the orthogonal properties of Bessel unction.

A.S.D.GOV.T.DEGREE COLLEGE FOR WOMEN (A)

Department of Mathematics

PROGRAMME: B.Sc(MPC, MPCs, MSCs)

2022-23

## **COURSE OUTCOMES**

**Paper : I**

**Course: Differential Equations**

**Course Outcomes:**

1. Solve linear differential equations
2. Convert non exact homogeneous equations to exact differential equations by using integrating factors
3. Know the methods of finding solutions of differential equations of the first order but not of the first degree
4. Solve higher order linear differential equations both homogeneous and non homogeneous with constant coefficients
5. Understand the concept and apply appropriate methods for solving differential equations

**Paper :II**

**Course: THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY**

**Course Outcomes:**

1. Understand the concept of planes
2. Analyze the right lines, sphere and cones
3. Understand the properties of planes, lines, spheres and cones
4. Express the problems geometrically and then to get the solution

**Paper :III**

**Course: ABSTRACT ALGEBRA**

**Course Outcomes:**

1. Acquire the basic knowledge and structure of groups, subgroups and cyclic groups
2. Get the significance of the notation of a normal subgroups

3. Study the homomorphism and isomorphism with applications
4. Get the behavior of permutations and operations on them
5. Understanding the ring theory concepts with the help of knowledge in group theory and to prove the theorems
6. Understand the applications of ring theory in various fields

**Course: ANALYTICAL SKILLS**

**Course Outcomes:**

1. Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.
2. Acquire competency in the use of verbal reasoning.
3. Apply the skills and competencies acquired in the related areas
4. Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

**Paper :IV**

**Course: REAL ANALYSIS**

**Course Outcomes:**

1. Get clear idea about the real numbers and real valued functions
2. Obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence / series
3. Test the continuity and differentiability and Riemann integration of a function
4. Know the geometrical interpretation of mean value theorems

**Paper :V**

**Course: LINEAR ALGEBRA**

**Course Outcomes:**

1. Understand the concepts of vector space, subspace, basis, dimension and their properties
2. Understand the concepts of linear transformations and their properties
3. Apply Cayley –Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine method

4. Learn the properties of inner product spaces and determine orthogonality in inner product spaces

**Paper :VIA**

**Course: NUMERICAL METHODS**

**Course Outcomes:**

1. Understand various numerical methods that are used to obtain approximate solutions
2. Understand various finite difference operators and interpolation methods
3. Work out numerical differentiation and integration whenever and wherever analytical methods are not applicable
4. Find numerical solutions of ordinary differential equations by using various numerical methods
5. Analyze and evaluate the accuracy of numerical methods

**Paper :VIB**

**Course: MATHEMATICS SPECIAL FUNCTIONS**

**Course Outcomes:**

1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations
2. Find power series solutions of ordinary differential equations
3. Solve Hermite equation and write the Hermite polynomial of order  $n$ , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite polynomial and recurrence relation
4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials
6. Solve Bessel equation and write the Bessel equation of first kind of order  $n$ , also find the generating function for Bessel function, understand the orthogonal properties of Bessel equation



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