

Syllabus for the **Ph.D** Student **Mr.T.Srinivas** (2018)

Admission.No: 18102003

### **Mathematics** (Broad Field Area)

**Guide:** Dr.K.Sridevi, Asst. Prof. of Mathematics, Dr. BRAOU

#### **Unit-1**

Group Theory- Definition of a group and its examples, Subgroups, Normal Subgroups and Quotient Groups, Homomorphisms, Permutation Groups, Sylow's Theorems. Ring Theory- Definition of a Ring and its examples, Subrings, Ideals and Quotient Rings, Integral Domains and Fields, Homomorphisms, Polynomial Rings.

#### **Unit-2**

Countable and Uncountable Sets, Euclidean Spaces, Metric Spaces, Continuous Functions, Complete Metric Spaces, Compact Sets and Connected Sets, Continuity and Compactness, Monotonic Functions, Sequences and Series of Functions, Uniform Convergence, Riemann-Stieltjes Integral.

#### **Unit-3**

Divisibility, Greatest Common Divisor, Prime Numbers, The Fundamental Theorem of Arithmetic, The Series of Reciprocals of the Primes, The Euclidean Algorithm. Arithmetical Functions and Dirichlet Multiplication - The Mobius Function , The Euler Totient Function, The Dirichlet Product of Arithmetic Functions, Dirichlet Inverses and the Mobius Inversion Formula, The Mangoldt Function, Multiplicative Functions and Dirichlet Multiplication, The Inverse of a Completely Multiplicative Function, Liouville's Function, The Divisor Functions, Generalized Convolutions .

#### **Unit-4**

Averages of Arithmetical Functions - Euler's Summation Formula, Some Elementary Asymptotic Formulas, The Average order of  $d(n)$ , The Average order of Divisor Functions, The average order of Euler Totient Function, the average order of Mobius Function and Mangoldt Function.

#### **Unit-5**

Congruences – Definition and Basic Properties of Congruences, Residue Classes and Complete Residue Systems, Linear Congruences, Residue Systems and Euler Fermat Theorem, Polynomial Congruences Modulo  $p$ /Lagrange's Theorem, Applications of Lagrange's Theorem , Simultaneous Linear Congruences, The Chinese Remainder Theorem, Applications of Chinese Remainder Theorem.

Syllabus for the **Ph.D Student Mrs.T.Swaroopa Rani (2018)**

Admission.No: 18102001

**Mathematics (Broad Field Area)**

**Guide:** Dr.K.Sridevi, Asst. Prof. of Mathematics, Dr. BRAOU

**Unit-1**

Group Theory- Definition of a group and its examples, Subgroups, Normal Subgroups and Quotient Groups, Homomorphisms, Permutation Groups, Sylow's Theorems. Ring Theory- Definition of a Ring and its examples, Subrings, Ideals and Quotient Rings, Integral Domains and Fields, Homomorphisms, Polynomial Rings.

**Unit-2**

Countable and Uncountable Sets, Euclidean Spaces, Metric Spaces, Continuous Functions, Complete Metric Spaces, Compact Sets and Connected Sets, Continuity and Compactness, Monotonic Functions, Sequences and Series of Functions, Uniform Convergence, Riemann-Stieltjes Integral.

**Unit-3**

Divisibility, Greatest Common Divisor, Prime Numbers, The Fundamental Theorem of Arithmetic, The Series of Reciprocals of the Primes, The Euclidean Algorithm. Arithmetical Functions and Dirichlet Multiplication - The Mobius Function, The Euler Totient Function, The Dirichlet Product of Arithmetic Functions, Dirichlet Inverses and the Mobius Inversion Formula, The Mangoldt Function, Multiplicative Functions and Dirichlet Multiplication, The Inverse of a Completely Multiplicative Function, Liouville's Function, The Divisor Functions, Generalized Convolutions .

**Unit-4**

Congruences – Definition and Basic Properties of Congruences, Residue Classes and Complete Residue Systems, Linear Congruences, Residue Systems and Euler Fermat Theorem, Polynomial Congruences Modulo  $p$ /Lagrange's Theorem, Applications of Lagrange's Theorem, Simultaneous Linear Congruences, The Chinese Remainder Theorem, Applications of Chinese Remainder Theorem.

**Unit-5**

Averages of Arithmetical Functions - Euler's Summation Formula, Some Elementary Asymptotic Formulas, The Average order of  $d(n)$ , The Average order of Divisor Functions, The average order of Euler Totient Function, the average order of Mobius Function and Mangoldt Function.

Syllabus for the **M.Phil Student Mrs.V.K.Prameela (2018)**

Admission.No: 18202003

**Mathematics (Broad Field Area),**

**Guide:** Dr.K.Sridevi, Asst. Prof. of Mathematics, Dr. BRAOU

**Unit-1**

Group Theory- Definition of a group and its examples, Subgroups, Normal Subgroups and Quotient Groups, Homomorphisms, Permutation Groups, Sylow's Theorems. Ring Theory - Definition of a Ring and its examples, Subrings, Ideals and Quotient Rings, Integral Domains and Fields, Homomorphisms, Polynomial Rings.

**Unit-2**

Countable and Uncountable Sets, Euclidean Spaces, Metric Spaces, Continuous Functions, Complete Metric Spaces, Compact Sets and Connected Sets, Continuity and Compactness, Monotonic Functions, Sequences and Series of Functions, Uniform Convergence, Riemann-Stieltjes Integral.

**Unit-3**

Linear Homogeneous Differential Equations with Constant Coefficients, Linear Non-Homogeneous Differential Equations with Constant Coefficients, Linear Differential Equations with Variable Coefficients, Linear Homogeneous Differential Equations with Analytical Coefficients, First Order Equations -Existence and Uniqueness, Systems of Differential Equations ,Two Dimensional Systems.

**Unit-4**

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**Unit-5**

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Syllabus for the **M.Phil** Student **Mr.M.Chakradhar Rao** (2018)

Admission.No:18202001

**Mathematics** (Broad Field Area)

**Guide:** Dr.K.Sridevi, Asst. Prof. of Mathematics, Dr. BRAOU

**Unit-1**

Group Theory- Definition of a group and its examples, Subgroups, Normal Subgroups and Quotient Groups, Homomorphisms, Permutation Groups, Sylow's Theorems. Ring Theory- Definition of a Ring and its examples, Subrings, Ideals and Quotient Rings, Integral Domains and Fields, Homomorphisms, Polynomial Rings.

**Unit-2**

Countable and Uncountable Sets, Euclidean Spaces, Metric Spaces, Continuous Functions, Complete Metric Spaces, Compact Sets and Connected Sets, Continuity and Compactness, Monotonic Functions, Sequences and Series of Functions, Uniform Convergence, Riemann-Stieltjes Integral.

**Unit-3**

Linear Homogeneous Differential Equations with Constant Coefficients, Linear Non-Homogeneous Differential Equations with Constant Coefficients, Linear Differential Equations with Variable Coefficients, Linear Homogeneous Differential Equations with Analytical Coefficients, First Order Equations -Existence and Uniqueness, Systems of Differential Equations ,Two Dimensional Systems.

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