BHAVAN'S VIVEKANANDA COLLEGE
DEPARTMENT OF MATHEMATICS & STATISTICS
ACADEMIC ORGANISER CBCS 19-20

B.Sc. I YEAR **SEMESTER -I**

Sub- MATHEMATICS **PAPER - MT121**

DIFFERENTIAL EQUATIONS & GROUPTHEORY

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT
JUNE &JULY	**1**	**UNIT III Groups-I (18)**	
	1	Introduction	1
	2	Groups-Definition and Elementary Properties	4
	3	Finite Groups and Group Tables	3
	4	Subgroups	3
	5	Cyclic Groups-Elementary properties, cyclic subgroups	7
	2	**UNIT IV Groups-II (15)**	
JULY	1	Permutations -functions and permutations	1
	2	Cycles and cyclic notations	1
	3	Even and odd permutations,	1
	4	Groups of permutations,Alternating groups	1
AUGUST	5	Groups of Coset	3
	6	Criteria for the existance of a coset group	1
	7	Inner automorphism and Normal Subgroups, Definition of Factor group	2
	8	Homomorphisms-Def. and Elementary properties	2
	9	The fundamental theorem of homomrphism, applications	1
	10	Isomorphism-Def. and Elementary properties,cayley's theorem	2
	3	**UNIT I D.E. of First Order and First Degree (15)**	
AUG&SEP AUG	1	Introduction	1
	2	Partial differentiation	1
	3	Exact Differential Equations	2
	4	Non-Exact Differential Equations,Integrating factors, Methods	6
	5	Linear Differential Equations	3
	6	Differential Equations Reducible to Linear Form	2
	4	**D.E. of the First Order but not of the First Degree (12)**	
SEPT &OCT	1	Equations Solvable for p	3
	2	Equations Solvable for y	2
	3	Equations Solvable for x	2
	4	Clairaut's Equation	2
	5	Total differential equations	3
	GRAND TOTAL		**60**

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B.Sc. I YEAR **SEMESTER -II**

Sub- MATHEMATICS **PAPER- MT221**

DIFFERENTIAL CALCULUS &HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT
1		**Differential Calculus I (15)**	
NOV	1	Introduction	1
	2	Succesive differentiation	3
	3	Calculation of nth derivatives of standard, rational & products of powers of sines and cosines	2
	4	The nth derivative of product of two functions.	3
DEC	5	Leibnitz's thereom	2
	6	Partial differntiation	1
	7	Homogeneous functions and Eulers theorem.	2
	8	Total derivatives	1
2		**Differential Calculus II (15)**	
DEC	1	Neighbourhood, interval, supremum, infimum, limits, continuity, differentiabilit	1
	2	Rolles , lagranges & Cauchy's theorem with geometric explanation.	4
	3	Taylors and Maclaurins series	3
JAN	4	Expansion of functions,Taylors and Maclaurins theorem	3
	5	Indeterminate forms	3
	6	Maxima and minima of two variables	1
3		**Higher Order Linear Differential Equations-I (15)**	
JAN	1	Solution of Homogeneous Linear Differential Equations of Order n with Constant Coefficients	3
	2	Solution of Non-homogeneous Linear Differential Equations with Constant Coefficients by means of Polynomial Operators(e^ax ,sinbx or cosbx)	4
FEB	3	Solution of Non-homogeneous Linear Differential Equations with Constant Coefficients by means of Polynomial Operators(x^k, e^axv, xv)	8
4		**Higher Order Linear Differential Equations II (15)**	
FEB&MAR	1	Method of Variations of Parameters(Non-homogeneous Linear Differential Equations with Constant Coeff.)	3
	2	Method of undetermined coefficients	3
	3	Reduction of order method	3
	4	The Cauchy-Euler Equation	3
	5	Legender's equation	3

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RING THEORY & PARTIAL DIFFERENTIAL EQUATIONS

B.Sc. II YEAR **SEMESTER -III**
Sub- MATHEMATICS **PAPER- MT321**

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT
1		**Rings-I (15)**	
JUNE	1	Introduction	1
	2	Rings-Def. ,Some non-commutative Examples , basic properties	2
	3	Divisors of zero ,cacellation laws	2
	4	Integral Domains, Fields	3
	5	Characteristic of a ring	2
JULY	6	Ideals and Factor Rings.	5
2		**Rings-II (15)**	
JULY	1	Homomorphisms of rings-Def, elementary properties, kernal of homomorshism	4
	2	Maximal and prime ideals , Prime fields	4
	3	Rings of Polynomials-Polynomials in an indeterminate form	4
	4	The evaluation homomorphism	3
3		**PARTIAL DIFFERENTIAL EQUATIONS-I (15)**	
AUGUST	1	Introduction	1
	2	Formation of partial differential equations	3
	3	Easilyintegrable partial differential equations	1
	4	Linear partial differential equations of first order	2
	5	Non Linear partial differential equations of first order	5
SEP	6	Charpits method	3
4		**PARTIAL DIFFERENTIAL EQUATIONS-II (15)**	
SEP & OCT	1	Homogeneous linear equations with constant coefficients	8
	2	Non Homogeneous linear partialdifferential equations	4
	3	Separation of variables	3

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REAL ANALYSIS

B.Sc. II YEAR **SEMESTER -IV**
Sub- MATHEMATICS **PAPER- MT421**

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT
1		**UNIT-I (15)**	
NOV	1	Limit of Sequences	4
	2	Limit Theorems for Sequences	4
DEC	3	Monotone Sequences	4
	4	Cauchy Sequences	3
2		**UNIT-II (15)**	
DEC	1	Subsequences	4
	2	Lim sup's and Lim inf's	1
JAN	3	Series	5
	4	Alternating Series	3
	5	Integral Tests	2
3		**UNIT-III (15)**	
JAN	1	Sequences of functions	3
	2	Series of functions	3
	3	Power Series	3
FEB	4	Uniform Convergence	3
	5	Differentiation and Intergration of Power Series(Theorems in this section without proofs)	3
4		**UNIT-IV (15)**	
FEB & MARCH	1	The Riemann Integral	5
	2	Properties of Riemann Integral	5
	3	Fundamental Theorem of Calculus	5

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MATHEMATICS PAPER III
B.Sc. - III Year SEM -V(2019-20)
MT 521-LINEAR ALGEBRA

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
1		VECTOR SPACES-I		
JUNE	1	Vector Space and Subspace	3	
	2	Linear combinations, Subspace spanned by a set	3	
	3	Linearly Independent and dependent sets	3	17
JULY	4	Basis	3	
	5	The co-ordinate system	2	
	6	The dimension of a vector space	3	
2		VECTOR SPACES-II		
JULY	1	Null space, Column space and Row space of a matrix	2	
	2	Basis and dimensions of Null space, Column space and Row space of a matrix	2	
	3	Linear Transformations, Kernel and range of Linear Transformations	2	10
AUG	4	Rank and rank theorem	3	
	5	Matrix of a Linear Transformations.	1	
3		EIGEN VALUES AND EIGEN VECTORS		
AUG	1	Eigen values , Eigen Vectors	2	
	2	The characteristic Equation	2	8
SEP	3	Diagonalization	3	
	4	Complex Eigen values.	1	
4		INNER PRODUCT OF VECTORS		
OCT	1	Inner Product, Length and Orthogonality	3	
	2	Orthogonal set	2	
	3	Gram-Schmidt Process	3	10
	4	Orthonormal Basis.	2	
GRAND TOTAL				45

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES AND COMMERCE
Sainikpuri, Secunderabad-500094
Autonomous College
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TEACHING PLAN: 2019-20
Program: B. Sc (M/E//P/S/Cs)
Paper Title: MT521A: VECTOR CALCULUS

DEPARTMENT OF MATHEMATICS AND STATISTICS	YEAR/ SEMESTER III/VI	NO.OF CLASSES PER WEEK 3 HRS PER WEEK(45) PRACTICALS 2 CLASSESPER WEEK

MONTH	UNIT	TOPIC	NUMBER OF CLASSES
JUNE& JULY	I	Vector differentiation and partial differentiation	5
		Vector differential operators – Gradient,Divergence, Curl	5
		Formulae involving Del	2
		Problems related Gradient,Divergence, Curl	3
	II	Definite Integral, Line Integrals	4
		Surface Integrals.	6
AUGUST	III	Volume Integrals	5
		Gauss Divergence theorem and its applications	5
SEPTEMBER & OCTOBER	IV	GREENS theorem and its applications	5
		STOKES theorem and its applications	5
		Total Classes	45

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ACADEMIC ORGANISER
MATHEMATICS PAPER III
B.Sc. - III Year SEM -VI(2019-20)
MT 621A-SOLID GEOMETRY

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
1		SPHERES		
NOV	1	Introduction, Definition, Equation of a sphere	2	13
	2	Sphere through four given points,, Equation of a Sphere under Different Conditions	3	
DEC	3	Equation of a circle	2	
	4	Intersection of a Sphere and a Line	2	
	5	Equation of a Tangent Plane	2	
	6	Angle of Intersection of Two Spheres	2	
2		CONES		
DEC	1	Introduction, Definition	2	10
	2	Condition that the General Equation of the Second Degree should represent a Cone	3	
JAN	3	Cone and a Plane through its Vertex	5	
3		CONES AND CYLINDERS		
JAN	1	Intersection of a line with a cone,Intersection of Two Cones with a Common Vertex	4	12
	2	Right Circular Cone	3	
	3	Enveloping cylinder ,The Cylinder	4	
FEB	4	Right Circular Cylinder	1	
4		CONICOIDS		
FEB	1	The general equation of the Second Degree	2	10
	2	Central conicoids	2	
	3	Intersection of the Line with a Conicoid	1	
MAR	4	Tangent line, Tangent planes and normal to conicoid	5	
GRAND TOTAL				45

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TEACHING PLAN: 2019-20
Program: B. Sc (M/E//P/S/Cs)
Paper Title: MT621: NUMERICAL ANALYSIS

DEPARTMENT OF MATHEMATICS AND STATISTICS	YEAR/ SEMESTER III/VI	NO.OF CLASSES PER WEEK 3 HRS PER WEEK (45) PRACTICALS 2 CLASSESPER WEEK

MONTH	UNIT	TOPIC	NUMBER OF CLASSES
NOVEMBER	II	Introduction, definitions of operators, relation between operators	2
DECEMBER		Differences of a polynomial, Newton's formulae for interpolation.	3
		Central Difference formulae (Gauss formulae ,Stirling's)	4
		Separartion of symbols	2
		Revision	2
JANUARY	III	Lagrange's interpolation formula	4
		Newton's Divided difference	3
		Neville's method,.	2
		Hermite's interpolation formula	2
		Revision	2
	IV	Numerical Differentiation	3
		Numerical Integration – Trapezoidal rule , Simpson's 1/3 rule.	3
FEBRUARY		Simpson's 3/8 rule, Boole's Rule.	2
		Weddle's rules , Romberg integration.	2
		Revision	3
	I	Introduction, Bisection method, Fixed point iteration(iteration method)	3
		Newton's method and it's extension (Newton Raphson method and Generalised Newton's)	2
MARCH		Muller's method.	2
		Revision	1

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SEM-5 GENERIC ELECTIVE I GE521

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
June	1	Percentages	5	20
July	2	Averages	5	
Aug	3	Ratio	5	
	4	Proportion	5	
UNIT2				
Aug & Sep	1	Modular Arithmetics	10	10
		Total	30	30

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SEM-6 GENERIC ELECTIVE II GE621

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
Nov&Dec	1	Time and work	10	20
Dec & Jan	2	Time and distance	10	
UNIT2				
Feb	1	Methods of solving equations in one variable.	10	10
		Total	30	30

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Skill Enhancement Course-SEM3
THEORY OF EQUATIONS SE321

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
	1	Graphic representation of a polynomial	1	
	2	Maxima and minima of polynomials	1	
JUNE	3	Theorems relating to the real roots of equations	4	
	4	Existence of a root in the general equation,Imaginary roots	4	15
	5	Theorem determining the number of roots of an equation,Equal roots,Imaginary roots	4	
JULY	6	Descarte's rule of signs for positive roots and negative roots.	1	
UNIT2				
		Relations between the roots and coefficients	3	
AUG		Theorems , Application of the Theorem	2	
		Depression of an equation when a relation exists between two of it's roots	3	15
		The cube roots of unity	4	
AUG & SEP		Symmetric Functions of the roots	3	
		TOTAL	30	30

DEPARTMENT OF MATHEMATICS AND STATISTICS
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Skill Enhancement Course-SEM4
LOGIC AND SETS SE421

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
	1	Basic connectives and truth tables	4	
NOV	2	logical equivalence: Laws of logic	4	
DEC	3	Rules inference :The use of quantifiers, Quantifiers	4	15
	4	Definitions and proofs of theorems.	3	
UNIT2				
JAN	1	Sets and subsets, Set operations and the laws of set theory	6	
	2	counting and Venn diagrams	4	15
JAN & FEB	3	The axioms of probability,Conditional probability, independence –discrete random variables	5	
		TOTAL	30	30

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Skill Enhancement Course-SEM6
GRAPH THEORY SE621

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
JUNE	1	Definition of Graph & Basic properties	6	15
	2	Examples of graphs,	2	
JULY	3	Isomorphisim of graphs.	7	
UNIT2				
	1	Paths and circuits	3	15
AUG	2	Eulerian circuits	3	
	3	Hamiltonian cycles, adjacency matrix	4	
SEP	4	shortest path algorithm	5	
		TOTAL	30	30

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Skill Enhancement Course-SEM 5
NUMBER THEORY SE 521

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
JUNE	1	The division algorithm, number patterns	2	15
JULY	2	prime and composite numbers, Fibonacci and Lucas' numbers	4	
	3	Fermat numbers, GCD	4	
AUG	4	LCM, Linear concurrences	5	
UNIT2				
AUG	1	Divisibility tests, Modular designs	2	15
	2	Check digits, The Chinese Remainder Theorem	4	
SEP	3	Wilson's theorem	4	
	4	Fermat's Theorem, Euler's Theorem	5	
		TOTAL		