DEPARTMENT OF MATHEMATICS

		SEMESTER-I			
Month	No. of Teaching days available	Topic		Class teaching in hours of each core	Tutorial In hours
		MTMACOR01T Marks:50+25=75 **Calculus and Geometry and Ordinary Differential Equation**	MTMACOR02T Marks:50+25=75 **Algebra**		
July,18	14	**Unit 1:** i)Leibintz Rule on diffn. ii)Point of Inflexion iii) Envelopes iv)Asymptote	**Unit -1 :** i)Polar rep. of complex numbers, nth roots of unity, ii)De Moivre's theorem . iii) Theory of equations: Relation between roots and coefficients, Transformation of equation.	11	3
August,18	25	**Unit 1** v)Curve tracing vi)L'Hospital's rule **Unit- 2** i)Reduction Formulae ii)Arc length of different curves iii) Area of surface of revolution iv) Techniques of sketching of conics	**Unit -1 :** iv)Descartes rule of signs, v)Cubic (Cardan's method) and biquadratic equations (Ferrari's method). **vi)Inequality**: The inequality involving AM≥GM≥HM, Cauchy-Schwartz inequality. **Unit -2 :** i) Relation, Partition ii) Mapping	20	Graphical Demonstration (Teaching Aid) Plotting of graphs of function 5

September,18	16	**Unit-3** i)Reduction of canonical form ii)Polar Equation of conic iii)Sphere iv)Conicoids	**Unit -2 :** iii)**Integer:** Well-ordering property, Division algorithm, Divisibilityand Euclidean algorithm. Congruence. iv)Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic .	13	Graphical Demonstration (Teaching Aid) Plottingthe graphs of polynomial of degree 4 and 5, the derivative graph, the second derivative graph andcomparing them 3
October,18	10	**Unit-3** v)Plane sections of conicoids vi))Generating lines vii) Graphing of standard quadric surfaces	**Unit -3:** **Linear Algebra**: i) Systems of linear equations, row reduction and echelon forms	8	2
November,18	13	**Unit -4:** i) Exact Differential equation, ii)Integrating factors iii)Linear equation iv)Bernoulli equations	**Unit 4:**, i) Vector equations, the matrix equation Ax=b, ii) Matrix inverse of a matrix, characterizations of invertible matrices. iii) Rank of a matrix	10	**Graphical Demonstration (Teaching Aid)**Sketching parametric curves (Eg. Trochoid, cycloid, epicycloids, hypocycloid). 3

December,18	12	Graphical Demonstration (Teaching Aid). .i)Tracing of conics in Cartesian coordinates/polar coordinates. vi)Sketching ellipsoid, hyperboloid of one and two sheets, elliptic cone, elliptic, paraboloid, and hyperbolicparaboloid usingCartesian coordinates.	**Unit 4:** **iv**)Eigen values, Eigen Vectors and Characteristic Equation of a matrix. v) Cayley-Hamilton theorem and its use in finding the inverse of a matrix.	10	Graphical Demonstration (Teaching Aid). iv)Obtaining surface of revolution of curves. 2

		SEMESTER-II			
Month	No. of Teaching days available	Topic		Class teaching in hours of each core	Tutorial In hours
		MTMACOR03T Marks:50+25=75 Real Analysis	**MTMACOR04T Marks:50+25=75 Differential Equation and Vector Calculus**		
January'19	4	**Unit-1:** **i)** Review of Algebraic and Order Properties of $\mathbb{R}$, ε-neighbourhood of a point in $\mathbb{R}$. Idea of countable sets, uncountable sets and unaccountability of $\mathbb{R}$..	**Unit-1 :** i)Lipschitz condition and Picard's Theorem (Statement only).	3	1

February,19	21	**Unit-1:** ii) Bounded above sets, Bounded below sets, Bounded Sets, Unbounded sets. iii) Suprema and Infima, Completeness Property of $\mathbb{R}$ and its equivalent properties. iv) The Archimedean Property, Density of Rational (and Irrational) numbers in $\mathbb{R}$, Intervals.	**Unit-1 :** ii) General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, iii) Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation.	17	4
March,19	13	**Unit-1:** v) Limit points of a set, Isolated points, Open set, closed set, derived set, Illustrations of Bolzano-Weierstrass theorem for sets. vi) compact sets in $\mathbb{R}$, Heine-Borel Theorem.	**Unit -2 :** iv) Method of undetermined coefficients, method of variation of parameters. **v)** System of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients.	10	3
April,19	13	**Unit-2 :** i)Sequences, Bounded sequence, Convergent sequence, Limit of a sequence, liminf, lim sup. Limit Theorems. Monotone Sequences, Monotone Convergence Theorem. ii) Subsequences, Divergence Criteria. Monotone Subsequence Theorem (statement only).	**Unit -2 :** vi) Basic Theory of linear systems in normal form, homogeneous linear systems with constant coefficients. iii) Two Equations in two unknown functions **Unit-3 :** **i)** Equilibrium points, Interpretation of the phase plane,	10	3

May,19	14	**Unit-2 :** iii)Bolzano Weierstrass Theorem for Sequences. iv) Cauchy sequence, Cauchy′s Convergence Criterion.	**Unit-3 :** ii) Power series solution of a differential equation about an ordinary point, solution about a regular singular point.	11	3
June,19	25	**Unit-3 :** **i)** Infinite series, convergence and divergence of infinite series, Cauchy Criterion, ii) Tests for convergence: Comparison test, Limit Comparison test, Ratio Test, Cauchy′s nth root test, Integral test. iii)Alternating series, Leibniz test. Absolute and Conditional convergence	**Unit- 4 :** i)Triple product, introduction to vector functions, operations with vector-valued functions ii) Limits and continuity of vector functions, differentiation and integration of vector functions.	20	5

HONOURS	NUMBER OF LECTURES	JULY-SEPTEMBER	OCTOBER -DECEMBER	JANUARY-MARCH	TEST EXAMINATION	APRIL-JUNE	UNIVERSITY FINAL EXAMINATION
PART II PAPER III	165	GROUP A CLASSICAL ALGEBRA II NO. OF CLASSES= 18	GROUP B ABSTRACT ALGEBRA NO. OF CLASSES=13	GROUP F APPLICATION OF INTEGRAL CALULUS NO. OF CLASSES=6		GROUP F APPLICATION OF INTEGRAL CALULUS NO. OF CLASSES=9	

		GROUP C LINEAR ALGEBRA NO. OF CLASSES=26	GROUP C LINEAR ALGEBRA NO. OF CLASSES=14				
		GROUP D REAL ANALYSIS II NO. OF CLASSES= 20	GROUP D REAL ANALYSIS II NO. OF CLASSES= 25	GROUP D REAL ANALYSIS II NO. OF CLASSES= 10			
			GROUP E FUNC. OF. SEVERAL VAR NO. OF CLASSES=8	GROUP E FUNC. OF. SEVERAL VAR. NO. OF CLASSES=12		GROUP E FUNC. OF. SEVERAL VAR. NO. OF CLASSES=4	
PART II PAPER IV	188	GROUP A ANALYTICAL GEOMETRY NO. OF CLASSES= 25	GROUP A ANALYTICAL GEOMETRY NO. OF CLASSES= 15				
		GROUP B DIFFERENTIAL EQN. NO. OF CLASSES=15	GROUP C LINEAR PROG. PROB. NO. OF CLASSES=10				
		GROUP C LINEAR PROG. PROB. NO. OF CLASSES=10	GROUP C LINEAR PROG. PROB. NO. OF CLASSES=15	GROUP C LINEAR PROG. PROB. NO. OF CLASSES=32			
		GROUP D ANALYTICAL DYNAMICS NO. OF CLASSES=18	GROUP D ANALYTICAL DYNAMICS NO. OF CLASSES=16	GROUP D ANALYTICAL DYNAMICS NO. OF CLASSES=36		GROUP D ANALYTICAL DYNAMICS NO. OF CLASSES=6	

DEPARTMENT OF MATHEMATICS

HONOURS	NUMBER OF LECTURES	JULY-SEPTEMBER	OCTOBER -DECEMBER	JANUARY-MARCH	TEST EXAMINATION	APRIL-JUNE
PART III PAPER V	115	GROUP A REAL ANALYSIS III NO. OF CLASSES= 37	GROUP A REAL ANALYSIS III NO. OF CLASSES=43	GROUP A REAL ANALYSIS III NO. OF CLASSES=15		UNIVERSITY FINAL EXAMINATION
		GROUP B METRIC SPACE NO. OF CLASSES=15	GROUP C COMPLEX ANALYSIS NO. OF CLASSES=15			

PART III PAPER VI	125	GROUP A PROBABILITY NO. OF CLASSES= 20	GROUP A PROBABILITY NO. OF CLASSES= 10			
		GROUP A STATISTICS NO. OF CLASSES=15	GROUP A STATISTICS NO. OF CLASSES=20			
		GROUP B NUMERICAL ANALYSIS NO. OF CLASSES=30	GROUP B NUMERICAL ANALYSIS NO. OF CLASSES=10	GROUP B COMPUTER PROG. NO. OF CLASSES=20		
PART III PAPER VII	122	GROUP A VECTOR ANALYSIS NO. OF CLASSES=10	GROUP CD HYDROSTATICS NO. OF CLASSES=25	GROUP CD HYDROSTATICS NO. OF CLASSES=10		
		GROUP B ANALYTICAL STATICS NO. OF CLASSES=23		GROUP B ANALYTICAL STATICS NO. OF CLASSES=19		
		GROUP C RIGID DYNAMICS NO. OF CLASSES=15	GROUP C RIGID DYNAMICS NO. OF CLASSES=10	GROUP C RIGID DYNAMICS NO. OF CLASSES=10		

DEPARTMENT OF MATHEMATICS

HONOURS	NUMBER OF LECTURES	JULY-SEPTEMBER	OCTOBER -DECEMBER	JANUARY-MARCH	TEST EXAMINATION	APRIL-JUNE
PART III PAPER VIIIA	65	GROUP A LINEAR ALGEBRA NO. OF CLASSES= 13	GROUP A MODERN ALGEBRA NO. OF CLASSES= 10			UNIVERSITY FINAL EXAMINATION
		GROUP A BOOLEAN ALGEBRA NO. OF CLASSES=10		GROUP C TENSOR CALCULUS NO. OF CLASSES= 17		
		GROUP B DIFFERENTIAL EQN. II NO. OF CLASSES= 15				

PART III PAPER VIIIB PRACTICAL	50	NUMERICAL ANALYSIS NO. OF CLASSES= 5	NUMERICAL ANALYSIS NO. OF CLASSES= 20	STATISTICS NO. OF CLASSES= 25		

DEPARTMENT OF MATHEMATICS

		SEMESTER-I		
Month	No. of Teaching days available	Topic **MTMGCOR01T** Marks:50+25=75 **Differential Calculus**	Class teaching in hours of each core	Tutorial In hours
July,18	14	i) Limit and Continuity (ε and δ definition), Types of discontinuities, ii)Differentiability of functions, iii)Successive differentiation, Leibnitz's theorem.	12	02
August,18	25	iv) Partial differentiation, Euler's theorem on homogeneous functions.	20	05
September,18	16	v)Tangents and Normals, vi) Curvature, vii)Asymptotes, viii)Singular points.	13	03
October,18	10	ix)Tracing of curves. Parametric representation of curves and tracing of parametric curves, Polar coordinates and tracing of curves in polar coordinates. x) Rolle's theorem, xi)Mean Value theorems	8	2

November,18	13	xii)Taylor's theorem with Lagrange's and Cauchy's forms of remainder, xiii)Taylor's series, Maclaurin's series of sin x, cos x, ex, log(l+x), (l+x)n	10	03
December,18	12	xiv)Maxima and Minima, xv) Indeterminate forms.	10	02

		SEMESTER-II		
Month	No. of Teaching days available	Topic **MTMGCOR02T** Marks:50+25=75 **Differential Equation**	Class teaching in hours of each core	Tutorial In hours
January,19	4	i) First order exact differential equations. Integrating factors.	3	1
February,19	21	ii) Rules to find an integrating factor. iii) First order higher degree equations solvable for x, y, p. Methods for solving higher-order differential equations iv) Basic theory of linear differential equations, Wronskian, and its properties. v) Solving a differential equation by reducing its order. vi) Linear homogenous equations with constant coefficients.	17	4
March,19	13	vii) Linear non-homogenous equations, viii) The method of variation of parameters. ix) The Cauchy-Euler equation, Simultaneous differential equations.	10	3

April,19	13	x) Total differential equations. xi)Order and degree of partial differential equations, Concept of linear and non-linear partial differential equations.	10	3
May,19	14	xii) Formation of first order partial differential equations, Linear partial differential equation of first order, Lagrange's method, Charpit's method	11	3
June,19	25	xiii) Classification of second order partial differential equations into elliptic, parabolic and hyperbolic through illustrations only	20	5

,
.

GENERAL	NUMBER OF LECTURES	JULY-SEPTEMBER	OCTOBER -DECEMBER	JANUARY-MARCH	TEST EXAMINATION	APRIL-JUNE	UNIVERSITY FINAL EXAMINATION
PART II PAPER -II	64	GROUP A MODERN ALGEBRA NO. OF CLASSES= 10	GROUP A MODERN ALGEBRA NO. OF CLASSES= 5	GROUP D INTEGRAL CALCULUS NO. OF CLASSES= 11			
		GROUP B THREE DIM. GEOMETRY NO. OF CLASSES=13	GROUP C DIFF. CALCULUS II NO. OF CLASSES=7	GROUP C DIFF. CALCULUS II NO. OF CLASSES=8			
				GROUP E DIFF. EQUATION II NO. OF CLASSES= 8			
PART II PAPER -III	100	GROUP A NUMERICAL METHODS NO. OF CLASSES= 10	GROUP A NUMERICAL METHODS NO. OF CLASSES= 5				
		GROUP B LINEAR PROG. PROB. NO. OF CLASSES=10	GROUP B LINEAR PROG. PROB. NO. OF CLASSES=10				

GENERAL	NUMBER OF LECTURES	JULY-SEPTEMBER	OCTOBER -DECEMBER	JANUARY-MARCH	TEST EXAMINATION	APRIL-JUNE	UNIVERSITY FINAL EXAMINATION
PART -II PAPER -III	100	GROUP C DYNAMICS OF A PARTTICLE NO. OF CLASSES= 10		GROUP C DYNAMICS OF A PARTTICLE NO. OF CLASSES= 10			
ANY ONE OF GR C, GR D, GR E.			GROUP D PROBABILITY & STATISTICS NO. OF CLASSES= 10	GROUP D PROBABILITY & STATISTICS NO. OF CLASSES= 10			
				GROUP E CALCULUS OF VARIATION NO. OF CLASSES= 20			
PART -III PAPER -IV	90	GROUP A ELEMENTS OF COMPUTER SCIENCE NO. OF CLASSES= 14	GROUP A ELEMENTS OF COMPUTER SCIENCE NO. OF CLASSES= 10	GROUP A ELEMENTS OF COMPUTER SCIENCE NO. OF CLASSES= 12			
ANY ONE OF GR A, GR B, GR C.		GROUP B A COURSE OF CALCULUS NO. OF CLASSES= 14	GROUP B A COURSE OF CALCULUS NO. OF CLASSES= 10	GROUP B A COURSE OF CALCULUS NO. OF CLASSES= 12			
		GROUP C DISCRETE MATHEMATICS NO. OF CLASSES= 14	GROUP C DISCRETE MATHEMATICS NO. OF CLASSES= 10	GROUP C DISCRETE MATHEMATICS NO. OF CLASSES= 12			