

*Department of Mathematics, GMGC*

**ACADEMIC CALENDAR (CBCS)  
(2021-2022)**

**MATHEMATICS HONOURS  
&  
MATHEMATICS GENERAL**

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Dr. Jayjayanti Ray  
(HEAD OF THE DEPARTMENT)

# ACADEMIC CALENDAR (2021-2022)

## MATHEMATICS HONOURS (CBCS)

### ODD SEMESTER, 2021-'22

SEMESTER-1 MTMA											
COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	October' 2021			November '21 - December'21			January' 2022			End Semester Examination
		<i>Topic</i>	<i>Lect ures</i>	<i>Facult y</i>	<i>Topic</i>	<i>Lect ures</i>	<i>Facu lty</i>	<i>Topic</i>	<i>Lectu res</i>	<i>Fac ulty</i>	
CORE-COURSE 1  Calculus, Geometry & Vector Analysis	Unit-1 : Calculus	Hyperbolic fns... Rectilinear Asymptotes	15	JR	Curve tracing ...life sciences	5	JR	Red.formulae. ...area & surface of rev.	5	MB	<b>28 February, 2022 - 2 March, 2022</b>
	Unit-2 : Geometry	Rotation of axes.. angle between two intersecting planes	15	JR	Parallelism. . generating lines	10	JR	Classification of Quadrics .... Ellipsoid	5	JR	
	Unit-3 : Vector Analysis	Triple product., Theory of Couples ...System of parallel forces.	6	JR	Introduction to vector functions... continuity of vector fns.	6	SB	Differentiation & integration of vector functions	3	SB	
	Teaching Aid	Plotting of graphs of function.. derivative graph	2	JR	Sketching Parametric ... Polar coordinates	2	SB	Sketching ellipsoid, ...using cart.cord.	1	SB	
CORE-COURSE 2  Algebra	Unit-1	polar rep. of complex nos... Transformati on of equations .	15	MB	Descartes rule .. Cauchy-Sc hwarz inequality	10	MB	linear difference equations. (upto 2nd order)	5	MB	
	Unit-2	Relation... mapping end	15	GS	Well ordering principle .. funda-ment al Th. of Arithmetic.	10	MB	Chinese remainder .... and their properties.	5	MB	
	Unit-3	Rank of a matrix... Systems of linear equations	15	GS	--	--	--	...			

## SEMESTER-3 MTMA

COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20) SEC-A (Theory.-80, Int. Assess.- 20)	Syllabus to be covered	September '2021			October '21 - November'21			December '2021- January' 2022			End Semester Examination
		Topic	Lect ures	Facu lty	Topic	Lect ures	Facu lty	Topic	Lect ures	Facu lty	
CORE-COURSE 5 Theory of Real Functions	Unit-1 : Limit & Continuity of functions	Limits of functions & continuity of functions	20	JR	Bounded functions..., Discontinuity of functions.	20	JR	Uniform Continuity.	5	JR	15 January - 18 January, 2022
	Unit-2 : Differentiability of functions	Diff. of fun. at a point ....mean value theorem respectively	15	MB	Expansion ... Hospital's & conseq.	15	MB	Pt. of local Extremum.. geom. problems	5	MB	
CORE-COURSE 6 Ring Theory & Linear Algebra-I	Unit-1 : Ring theory	Definition and examples of rings..character istics of a ring	15	GS	Ideal ....third isomorphism theorem	15	GS	Corresponde nce theorem ... , congruences on rings.	5	GS	
	Unit-2 : Linear algebra	Vector spaces,..signifi cance of subspace.	15	GS	Linear Transformati ons ..... isomorphism	20	GS	EigenValues .... inverse of a matrix	5	GS	
CORE-COURSE 7 ODE & Multivariate Calculus-I	Unit-1 Ordinary differential equation	1st order d.e... uniqueness theorem of Picard's	15	MB	Linear equations.... variation of parameters	15	MB	System of Linear d.e's...power series soln.	10	MB	
	Unit-2 : Multivariate Calculus-I	Concept of nbd... closed set in $R^n$ ( $n > 1$ ).	10	JR	Functions from $R^n$ ... tangent planes.	15	JR	Extrema of functions... optimization problems	10	JR	
Skill Enhancement Course-A SEC-A	SEC-A1: C Programming Language	An overview of theoretical computers.. importance of C programming	10	JR	Constants, Variables... control statements.	15	JR	Arrays,..., User-defined functions..., Introduction to library functions	5	JR	

## SEMESTER-5 MTMA

COURSES & ELECTIVES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	September' 2021			October '21 - November'21			December' 2021- January' 2022			End Semester Examination
		Topic	Lect ures	Facu lty	Topic	Lect ures	Facu lty	Topic	Lect ures	Facu lty	
<b>CORE-COURSE -11</b> Probability & Statistics	Probability: UNIT-1 UNIT-2 UNIT3 Statistics: UNIT-4 UNIT-5	UNIT-1, UNIT-2	16	JR	UNIT-2, UNIT-3, UNIT-4	16	JR	UNIT-4, UNIT-5	14	JR	<b>15 January - 18 January, 2022</b>
<b>CORE-COURSE-12</b> Group Theory-II & Linear Algebra-II	Unit-1 : Group theory	Automorphism .... cyclic gps..	15	GS	Appl. of factor groups Ext. direct product.. int. direct product,	15	GS	converse of Lagrange's theorem... Fundamental th. of finite abelian gps	5	GS	
	Unit-2 : Linear algebra	Inner product spaces... basic properties	15	GS	Bilinear and quadratic forms... signature	15	GS	Dual spaces... canonical forms	10	GS	
<b>Discipline Specific Elective- A</b> DSE-A(1)-1 Advanced Algebra	Unit-1: Group Theory Unit-2: Ring Theory	Unit-1	20	GS	Unit-1, Unit-2	28	GS	Unit-2	27	GS	
<b>Discipline Specific Elective- B</b> DSE-B(1)-2 Linear Programming & Game Theory	UNIT-1 UNIT-2 UNIT3 UNIT4	UNIT-1, UNIT-2	20	MB	UNIT-2, UNIT-3	25	MB	UNIT-4	30	MB	

## EVEN SEMESTER, 2022

SEMESTER-2 MTMA											
COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	February'2022 to March'2022			April'2022 to May'2022			June' 2022			End Semester Examination
		<i>Topic</i>	<i>Lectur es</i>	<i>Facul ty</i>	<i>Topic</i>	<i>Lectu res</i>	<i>Facul ty</i>	<i>Topic</i>	<i>Lect ures</i>	<i>Facu lty</i>	
CORE-COURSE 3 <i>Real Analysis</i>	<b>Unit-1 Real no.Sets</b>	Intuitive Idea Of Real Numbers... density of rational numbers	12	GS	Intervals ... Complement of open and close sets	12	GS	Union and intersectio n ....dense in R	6	GS	<b>15 July - 23 July, 2022</b>
	<b>Unit-2 Real Sequence</b>	Real Sequence.. Cauchy's first and second Limit Th	12	JR	Subsequential Limits.... Definition is assumed	15	JR	A bounded sequence .....Cauchy Sequence.	8	JR	
	<b>Unit-3 Infinite Series</b>	--	--		Infinite Series...limit comparison test	5	JR	ratio test... conditional converg.	5	JR	
CORE-COURSE 4 <i>Group Theory-I</i>	<b>Unit - 1</b>	Symmetries of a Square .. elementary properties of groups .	10	MB	Examples of commutative .. to be a sub-group	12	GS	Normalizer ....two sub groups	8	GS	
	<b>Unit - 2</b>	Properties of cyclic groups .. properties of permutations	10	MB	Even and odd permutation .. order of a group	10	MB	Lagranges' Th. .... Fermat's little theorem	5	MB	
	<b>Unit -3</b>	Normal subgroups ... quotient group	6	GS	Group homomorphis m... Cayley's theorem	6	GS	Properties of Isomorphis m ... third isomorphis m theorem	8	GS	

## SEMESTER-4 MTMA

COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20) SEC-B (Theory.-80, Int. Assess.- 20)	Syllabus to be covered	February'2022 to March'2022			April'2022 to May'2022			June' 2022			End Semester Examina- tion
		Topic	Lectu res	Facul ty	Topic	Lect ures	Facul ty	Topic	Lectu res	Facul ty	
CORE-COURSE -8 Riemann Integration & Series of Functions	Unit-1 : Riemann integration Unit-2 : Improper integrals Unit-3 : Series of functions	Unit-1 : Partition.. Example of Riemann integrability of sums	30	GS	Unit-1 contd. , Unit-2 & Unit 3	5 +  10 15	GS	Unit-3 contd	15	GS	<b>5 July- 16 July, 2022</b>
	CORE-COURSE 9 PDE & Multivariate Calculus-II	Unit-1 : Partial differential equation	PDEs of 1st order.. Laplace eqn.	15	MB	Classification ....canonic form. Cauchy Prob...free end	5  10	MB  JR	Eqns with non-homog eneous ... heat cond. prob.	10	
Unit-2 : Multivariate Calculus-II		Multiple integral .. change of order of integration	15	JR	Triple integral .. divergence and curl	15	JR	Line integrals .. Divergence theorem	5	JR	
CORE-COURSE 10 Mechanics	Unit-1 (Statics)	Coplanar forces in general	4	JR	An arbitrary force system in space	8	JR	Equilibrium in the presence of sliding Friction force	3	JR	
	Unit-2 (Statics)	-	-	JR	Virtual work	5	JR	Stability of equilibrium	5	JR	
	Unit-3, 4, 5 (Dynamics)	Unit-3	20	MB	Unit-4	20	MB	Unit-5	10	MB	
Skill Enhancement Course-B SEC-B	SEC-B1 Mathematic al Logic	Unit-1	20	JR	Unit-2	20	JR	Unit-3	10	JR	

## SEMESTER-6 MTMA

COURSES & ELECTIVES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	February' 2022			March'2022 to April'2022			May' 2022 to June' 2022			End Semester Examination
		Topic	Lectures	Faculty	Topic	Lectures	Faculty	Topic	Lectures	Faculty	
CORE-COURSE -13 Metric Space & Complex Analysis	Unit-1 : Metric space	Definition and examples of metric spaces ... Subspace of a metric space.	10	GS	Convergent sequence.. compact sets.	20	GS	Concept of connected -ness.... application to ordinary differential equation	10	GS	27 June - 13 July, 2022
	Unit-2 : Complex analysis	Stereographic projection. ....Continuity of functions of complex variables.	10	GS	Derivatives .... Uniqueness of power series	15	GS	Contours,.. Cauchy integral formula.	10	GS	
CORE-COURSE-14 Numerical Methods	Numerical Methods Unit-1,2,3,4, 5,6	Unit-1, 2	5+5	MB	Unit-2 (contd.), 3, 4	10+ 10+10	MB	Unit-5, 6	10+5	MB	
Core Course-14 Practical Numerical Methods Lab	1 - 9 Practical Topics	1-2	10	JR	3-6	25	JR	7-9	15	JR	
Discipline Specific Elective- A DSE-A(2)-2 Mathematical Modeling	2. Mathematical Modeling Unit-1,2	Unit-1	15	MB	Unit-1 contd., Unit-2	25	MB	Unit-2 (contd.)	15	S.L. (PP)	
Discipline Specific Elective- B DSE-B(2)-1 Point Set Topology	1.Point Set Topology Unit-1,2,3	Unit-1	15	GS	Unit-1 (contd.)  Unit-2,3	20  20	GS  S.L. (SC)	Unit-3 (contd.)	20	S.L. (SC)	

**S.L. – SPECIAL LECTURE**

# ACADEMIC CALENDAR (2021 - 2022)

## MATHEMATICS GENERAL - CBCS

### ODD SEMESTER, 2021-'22

<b>SEMESTER-1 MTMG</b>											
COURSE Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered (with marks)	October' 2021			November '21 - December'21			January' 2022 - February' 2022			End Semester Examination
		Topic	Lectures	Faculty	Topic	Lectures	Faculty	Topic	Lectures	Faculty	
<b>Generic Elective-1</b>	Unit-1 : Algebra-I	Complex nos., Polynomials	2	MB	Statements of..transformations of equation	4	MB	Cardan's method ... matrix method	4	MB	<b>3rd March, 2022</b>
	Unit-2 : Differential Calculus-I	Rational numbers	4	GS	Real-valued functions... .. Successive derivative	10	GS	Functions of two and three variables.... Applns. of diff cal.	6	GS	
	Unit-3 : Differential Equation-I	Order, degree.. formation of d.e.	2	MB	First order equations... Second order linear equations	4	MB	2nd order diff.eqns. contd.	4	MB	
	Unit-4 : Coordinate Geometry	Transformations of Rectangular axes... Classification of conic	5	JR	Pair of straight lines..upto equations of Tangents & normals	10	JR	Sphere, cone	5	JR	
<b>SEMESTER-3 MTMG</b>											
COURSE Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered (with marks)	September '2021			October '21 - November'21			December '2021- January' 2022			21st January, 2022
		Topic	Lectures	Faculty	Topic	Lectures	Faculty	Topic	Lectures	Faculty	
<b>Generic Elective-3</b>	Unit-1 : Integral Calculus	Evaluation of definite integrals, Integration as the limit of a sum	4	GS	Reduction formulae .. double integral.	3	GS	Applications	3	GS	
	Unit-2 : Numerical Methods	Approx. numbers, operators	8	MB	Interpolation	7	MB	Numerical Integration ...Numerical Problems	10	MB	



	<b>Unit-3 : Linear Programming</b>	Motivation of Linear Programming problem.... Non-degenerate B.F.S	10	MB	The set of all feasible solutions... upto Dual problems with.....equality	10	MB	Transportation ....solutions	5	MB	
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## EVEN SEMESTER, 2021-2022

<b>SEMESTER-2 MTMG</b>											
<b>COURSES</b> Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	February'2022 to March'2022			April'2022 to May'2022			June' 2022			End Semester Examination
		Topic	Lect-ures	Fac-ulty	Topic	Lect-ures	Facu- lty	Topic	Lectur- es	Fac- ulty	
<b>Generic Elective-2</b>	<b>Unit-1 : Differential Calculus-II</b>	Sequence of Real numbers & Infinite Series	8	MB	Real valued functions & Indeterminate forms	8	MB	Application .... Undetermined multiplier	2	MB	<b>27th July, 2022</b>
	<b>Unit-2 : Differential Equation-II</b>	Linear Homogeneous eqns	4	MB	Order & degree ...Linear PDE	4	MB	Lagrange & Charpit's method	2	MB	
	<b>Unit-3 : Vector Algebra</b>	Addn of vectors ... vector products	3	MB	Simple application ..Problems of Mechanics	2	MB				
	<b>Unit-4 : Discrete Mathematics</b>	Principle of Math induction... Linear Diophantine eqn.	4	MB	Applns in diff probs ...some Applns	4	MB	Boolean Algebra	2	GS	
		Congruences ...some Applns	6	GS	Applns of congruence S .... Detection capability	7	GS	Congruence classes ... Wilson's theorem	4	GS	

## SEMESTER-4 MTMG

COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	February'2022 to March'2022			April'2022 to May'2022			June' 2022		
		Topic	Lect-ures	Fac-ulty	Topic	Lect-ures	Facu- lty	Topic	Lectur- es	Fac- uly
<b>Generic Elective-4</b>	<b>Unit-1 : Algebra-II</b>	Introduction of Group Theory... subgroups	3	GS	Defn. & ex... sub field, concept of vector space	4	GS	Real Quadratic Form..... Cayley -Hamilton Theorem	3	GS
	<b>Unit-2 : Computer Science &amp; Programming</b>	Computer Science and Programming .... hardware and Software.	10	JR	Positional Number System... PASCAL, etc.	9	JR	Algorithms and FlowCharts ... Fortran Expression.	6	JR
	<b>Unit-3 : Probability &amp; Statistics</b>	Elements of probability Theory, Theoretical Probability Distribution	5	MB	Elements of Statistical Methods, Sampling,, F -distribn.	15	MB	Estimation and Test of Significance .... Regression lines.	5	MB

**18th  
July,  
2022**

Dr. Jayjayanti Ray  
(HEAD OF THE DEPARTMENT)