

Department of Mathematics, GMGC

**ACADEMIC CALENDAR (CBCS)
(2022-2023)**

**MATHEMATICS HONOURS
&
MATHEMATICS GENERAL**

Dr. Gokul Saha
(HEAD OF THE DEPARTMENT)

ACADEMIC CALENDAR (2022-2023)

MATHEMATICS HONOURS (CBCS)

ODD SEMESTER, 2022-'23

SEMESTER-1 MTMA											
COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	Oct'22 to Nov'22			Dec'22			Jan'23 to Feb'23			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	10	JR	Red.formulae. ...area & surface of rev.	10	JR	2 nd WEEK of February, 2023
	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	MB	Introduction to vector functions... continuity of vector fns.	6	MB	Differentiation & integration of vector functions	3	MB	
	Teaching Aid	Plotting of graphs of function.. derivative graph	2	JR	Sketching Parametric ... Polar coordinates	2	JR	Sketching ellipsoid,using cart.cord.	1	JR	
CORE-COURSE 2 Algebra	Unit-1	polar rep. of complex nos... Transformati on of equations .	15	MB	Descartes rule .. Cauchy- Schwarz inequality	10	MB	linear difference equations. (upto 2nd order)	5	MB	
	Unit-2	Relation... mapping end	15	GS	Well ordering principle .. funda- mental Th. of Arithmetic.	10	GS	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'22 to October '22			November'22 to December '22			January '23			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	2ND WEEK of JANUARY, 2023
	Unit-2 : Differentiabili ty of functions	Diff. of fun. at a pointmean 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	Idealthird 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'22 to October '22			November'22 to December '22			January '23			End Semester Examination
		<i>Topic</i>	<i>Lect ures</i>	<i>Facu lty</i>	<i>Topic</i>	<i>Lect ures</i>	<i>Facu lty</i>	<i>Topic</i>	<i>Lect ures</i>	<i>Facu lty</i>	2ND WEEK of JANUARY, 2023
CORE-COURSE -11 Probability & Statistics	Probability: UNIT-1 UNIT-2 UNIT3 Statistics: UNIT-4 UNIT-5	UNIT-1, UNIT-2	16	MB	UNIT-2, UNIT-3, UNIT-4	16	JR	UNIT-4, UNIT-5	14	JR	
CORE-COURSE-12 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... Fundamenta l th. of finite abelian gps	5	GS	
	Unit-2 : Linear algebra	Inner product spaces... basic properties	15	SB	Bilinear and quadratic forms... signature	15	SB	Dual spaces... canonical forms	10	SB	
Discipline Specific Elective- A 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	
Discipline Specific Elective- 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, 2023

SEMESTER-2 MTMA											
COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	March'23 to			April'23			May'23			End Semester Examination
		<i>Topic</i>	<i>Lectures</i>	<i>Faculty</i>	<i>Topic</i>	<i>Lectures</i>	<i>Faculty</i>	<i>Topic</i>	<i>Lectures</i>	<i>Faculty</i>	
CORE-COURSE 3 <i>Real Analysis</i>	Unit-1 Real no.Sets	Intuitive Idea Of Real Numbers... density of rational numbers	12	JR	Intervals ... Complement of open and close sets	12	JR	Union and intersectiondense in R	6	JR	2ND WEEK OF JULY, 2023
	Unit-2 Real Sequence	Real Sequence.. Cauchy's first and second Limit Th	12	JR	Subsequential Limits.... Definition is assumed	12	JR	A bounded sequenceCauchy Sequence.	6	JR	
	Unit-3 Infinite Series	--	--		Infinite Series...limit comparison test	5	MB	ratio test... conditional converg.	5	MB	
CORE-COURSE 4 <i>Group Theory-I</i>	Unit - 1	Symmetries of a Square .. elementary properties of groups .	12	GS	Examples of commutative .. to be a sub- group	12	GS	Normalizertwo sub groups	6	GS	
	Unit - 2	Properties of cyclic groups .. properties of permutations	10	GS	EVEN and odd permutation .. order of a group	10	GS	Lagranges' Th. ... Farnet's little theorem	5	GS	
	Unit - 3	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'23 to March'23			April'23			May'23			End Semeste r Examina- tion
		<i>Topic</i>	<i>Lectu res</i>	<i>Facul ty</i>	<i>Topic</i>	<i>Lect ures</i>	<i>Facul ty</i>	<i>Topic</i>	<i>Lectu res</i>	<i>Facul ty</i>	
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	3rd WEEK of JUNE
		CORE-COURSE 9 PDE & Multivariate Calculus-II	Unit-1 : Partial differential equation	PDEs of 1st order.. Laplace eqn.	15	MB	Classificationcanonic form Cauchy Prob...free end	5 10	MB JR	Eqns with non- homogene ous ... heat cond. prob.	
Unit-2 : Multivariate Calculus-II	Multiple integral .. change of order of integration		10	JR	Triple integral .. divergence and curl	20	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'23 to March'23			April'23			May'23			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 connectedness.... application to ordinary differential equation	10	GS	3 rd WEEK of JUNE 1
	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+1 0		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)-1 Differential Geometry	Mathematical Modelling Unit-1,2,3	Unit-1, 2	10+10	MB & S.L	Unit-2 contd., Unit-3	25 + 15	S.L	Unit-3 (contd.)	15	MB, S.L.	
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, Unit-3	20 + 15 + 5	GS	Unit-3 (contd.)	20	GS	

S.L. .. SPECIAL LECTURE

ACADEMIC CALENDAR (2022 - 2023)

MATHEMATICS GENERAL - CBCS

ODD SEMESTER, 2022-23

SEMESTER-1 MTMG											
COURSE Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered (with marks)	Oct'22 to Nov'22			Dec'22			Jan'23 to Feb'23			End Semester Examination
		Topic	Lectures	Faculty	Topic	Lectures	Faculty	Topic	Lectures	Faculty	3rd WEEK of February, 2023
Generic Elective-1	Unit-1 : Algebra-I	complex nos., Polynomials	2	MB	Statements of..transformations of equation	4	MB	Cardan's method ... matrix method	4	MB	
	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	JR	
	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	
SEMESTER-3 MTMG											
COURSE Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered (with marks)	September'22 to October '22			November'22 to December '22			January '23			3rd WEEK of JANUARY, 2023
		Topic	Lectures	Faculty	Topic	Lectures	Faculty	Topic	Lectures	Faculty	
		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	JR	Interpolation	7	JR	Numerical Integration ...Numerical	10	JR	

								Problems		
	Unit-3 : Linear Programming	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

EVEN SEMESTER, 2023

SEMESTER-2 MTMG											
COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	March'23			April'23			May'23			End Semester Examination
		Topic	Lect-ures	Fac-ulty	Topic	Lect-ures	Fac-ulty	Topic	Lectur-es	Fac-ulty	
Generic Elective-2	Unit-1 : Differential Calculus-II	Sequence of Real numbers & Infinite Series	8	JR	Real valued functions & Indeterminate forms	8	JR	Application Undetermined multiplier	2	JR	3RD WEEK OF JULY
	Unit-2 : Differential Equation-II	Linear Homogeneous eqns	4	JR	Order & degree ...Linear PDE	4	JR	Lagrange & Charpit's method	2	JR	
	Unit-3 : Vector Algebra	Addn of vectors ... vector products	3	MB	Simple application ..Problems of Mechanics	2	MB				
	Unit-4 : Discrete Mathematics	Principle of Math induction... Linear Diophantine eqn.	4	MB	Applns in diff probs ...some Applns	4	MB	Boolean Algebra	2	JR	
		Congruences ...some Applns	6	MB	Applns of congruence s Detection capability	7	MB	Congruence classes ... Wilson's theorem	4	MB	

SEMESTER-4 MTMG

COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	February'23 to March'23			April'23			May'23		
		Topic	Lect-ures	Fac-ulty	Topic	Lect-ures	Facu-ly	Topic	Lectur-es	Fac-ulty
Generic Elective-4	Unit-1 : Algebra-II	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
	Unit-2 : Computer Science & Programming	Computer Science and Programming hardware and Software.	10	JR	Positional Number System... PASCAL, etc.	9	JR	Algorithms and FlowCharts ... Fortran Expression.	6	JR
	Unit-3 : Probability & Statistics	Elements of probability Theory, Theoretical Probability Distribution	5	MB	Elements of Statistical Methods, Sampling,.. F -distribn.	5 10	MB SB	Estimation and Test of Significance Regression lines.	5	MB

**FIRST
WEEK
OF July
2023**

Dr. Gokul Saha
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