Department of Mathematics, GMGC

ACADEMIC CALENDAR (CBCS) (2020-2021)

MATHEMATICS HONOURS
&
MATHEMATICS GENERAL

Dr. Jayjayanti Ray
(HEAD OF THE DEPARTMENT)

ACADEMIC CALENDAR (2020-2021)
MATHEMATICS HONOURS (CBCS)

ODD SEMESTER, 2020-'21

SEMESTER-1 MTMA											
COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	**Syllabus to be covered**	**Dec'20 to Jan'21**			**Jan'21 to Feb'21**			**March'21**			**End Semester Examination**
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
CORE-COURSE 1 Calculus, Geometry & Vector Analysis	**Unit-1 : Calculus**	Hyperbolic fns… Rectilinear Asymptotes	15	SB	Curve tracing ….life sciences	5	SB	Red.formulae. . ..area & surface of rev.	5	SB	**3RD WEEK of March, 2021**
	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… Transformation 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	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**	**December '20**			**January '21**			**February '21**			**End Semester Examination**
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
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 MARCH, 2021**
	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..characteristics of a ring	15	GS	Ideal ….third isomorphism theorem	15	GS	Correspondence theorem .. , congruences on rings.	5	GS	
	Unit-2 : Linear algebra	Vector spaces,..significance of subspace.	15	GS	Linear Transformations …… 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	JR	
	Unit-2 : Multivariate Calculus-I	Concept of nbd… closed set in Rn (n > 1).	10	SB	Functions from Rn… tangent planes.	15	SB	Extrema of functions… optimization problems	10	SB	
Skill Enhancement Course-A SEC-A	**SEC-A1: C Programming Language**	An overview of theoretical computers.. importance of C programming	10	SB	Constants, Variables… control statements.	15	SB	Arrays,..., User-defined functions…, Introduction to library functions	5	SB	

SEMESTER-5 MTMA

COURSES & ELECTIVES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	December '20			January '21			February '21			End Semester Examination
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
CORE-COURSE -11 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	**2ND WEEK of MARCH, 2021**
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… Fundamental 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, 2021

SEMESTER-2 MTMA

COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	April'21 to May'21			May'21 to June'21			July'21			End Semester Examination
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
CORE-COURSE 3 Real Analysis	Unit-1 Real no.Sets	Intuitive Idea Of Real Numbers… density of rational numbers	12	SB	Intervals … Complement of open and close sets	12	SB	Union and intersection ….dense in R	6	SB	**2ND WEEK OF AUGUST, 2021.**
	Unit-2 Real Sequence	Real Sequence.. Cauchy's first and second Limit Th	12	JR	Subsequential Limits…. Definition is assumed	12	JR	A bounded sequence …..Cauchy Sequence.	6	JR	
	Unit-3 Infinite Series	--	--		Infinite Series...limit comparison test	5	JR	ratio test… conditional converg.	5	JR	
CORE-COURSE 4 Group Theory-I	Unit - 1	Symmetries of a Square .. elementary properties of groups .	12	GS	Examples of commutative .. to be a sub-group	12	GS	Normalizer ….two sub groups	6	GS	
	Unit - 2	Properties of cyclic groups .. properties of permutations	10	MB	Ven and odd permutation .. order of a group	10	MB	Lagranges' Th. … Farmer's little theorem	5	MB	
	Unit -3	Normal subgroups … quotient group	6	GS	Group homomorphism… Cayley's theorem	6	JR	Properties of Isomorphism … third isomorphism theorem	8	SB	

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	April'21 to May'21			May'21 to June'21			July'21			End Semester Examina-tion
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
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	**FIRST WEEK OF AUGUST, 2021**
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	JR	
	Unit-2 : Multivariate Calculus-II	Multiple integral .. change of order of integration	10	SB	Triple integral .. divergence and curl	20	SB	Line integrals .. Divergence theorem	5	SB	
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 Mathematical Logic**	Unit-1	20	Expert Guest faculty	Unit-2	20	Expert Guest faculty	Unit-3	10	Expert Guest faculty	

SEMESTER-6 MTMA

COURSES & ELECTIVES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	April'21			May'21 to June '21			July'21			End Semester Examina-tion
		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	Last week of July, 2021
	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	**1.Differential Geometry Unit-1,2,3**	Unit-1, 2	10+10	MB	Unit-2 contd., Unit-3	25 + 15	MB	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	JR, S.L & R*	Unit-1 (contd.), Unit-2, Unit-3	20 + 15 + 5	S.L & R*	Unit-3 (contd.)	20	S.L & R*	

S.L. .. SPECIAL LECTURE

S.L & R* --- SPECIAL LECTURE & REMEDIAL CLASSES

ACADEMIC CALENDAR (2020 - 2021)
MATHEMATICS GENERAL - CBCS

ODD SEMESTER, 2020-'21

SEMESTER-1 MTMG

COURSE Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered (with marks)	Dec'20 to Jan'21			Jan'21 to Feb'21			March'21			End Semester Examination
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
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	4TH WEEK of MARCH, 2021
	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	SB	First order equations… Second order linear equations	4	SB	2nd order diff.eqns. contd.	4	SB	
	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	SB	

SEMESTER-3 MTMG

COURSE Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered (with marks)	December '20			January '21			February '21			3RD WEEK of MARCH, 2021
		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 Problems	10	SB	

| | 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 | SB | |

EVEN SEMESTER, 2021

SEMESTER-2 MTMG

COURSES Full Marks :100 (Theory-65 Tutorial-15 Int. Assess.-20)	Syllabus to be covered	April'21 to May'21			May'21 to June'21			July'21			End Semester Examination
		Topic	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	*Topic*	*Lectures*	*Faculty*	
Generic Elective-2	**Unit-1 : Differential Calculus-II**	Sequence of Real numbers & Infinite Series	8	SB	Real valued functions & Indeterminate forms	8	SB	Application …. Undetermined multiplier	2	JR	
	Unit-2 : Differential Equation-II	Linear Homogeneous eqns	4	JR	Order & degree …Linear PDE	4	JR	Lagrange & Charpit's method	2	JR	**3RD WEEK OF AUGUST, 2021**
	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	GS	Applns of congruences …. 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	April'21 to May'21			May'21 to June'21			July'21			FIRST WEEK OF August, 2021
		Topic	*Lect-ures*	*Fac-ulty*	*Topic*	*Lect-ures*	*Facu-lty*	*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	**FIRST WEEK OF August, 2021**
	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	SB	

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