

MOYNA COLLEGE

DEPARTMENT OF MATHEMATICS

Teaching Plans of Tamal Kanti Kar for Session 2016-17 (HONOURS)

➤ PART – I

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
1 st	Hons	I	Classical Algebra	Unit – I Complex numbers: De-Moivre's theorem and its applications,	09.08.16 – 20.08.16	6	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. S.K.Mapa: Classical Algebra, 2. Burnside and Panton: Theory of Equations (Vol. I), 3. Chakravorty & Ghosh: Advanced Higher Algebra, 4. R.M.Khan: Advanced Algebra.
				Unit – II Exponential, Sine, Cosine and Logarithm of complex number, definition of a^z ($a \neq 0$). Inverse circular and hyperbolic functions.	23.08.16 – 06.09.16	7		
				Unit – III Polynomials with real co-efficient: Fundamental theorem of classical algebra (no proof required), n-th degree polynomial equations has exactly n roots. Nature of roots of an equation (surd / complex roots occur in pair).	07.09.16 – 27.09.16	7		
				Unit – IV Statement of Descartes' rule of signs and Sturm's theorem and their applications, Location of Roots, Multiple roots, Relations between roots and coefficients, symmetric functions of the roots, transformations of equations.	03.12.16 – 21.12.16	8		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
1 st	Hons	I	Classical Algebra	Unit – V Reciprocal equation, Cardan’s method of solution of a cubic equation, Ferrari’s method of solution of a biquadratic equation, Binomial equations, special roots.	24.12.16 – 24.01.17	11	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example,	1. S.K.Mapa: Classical Algebra, 2. Burnside and Panton: Theory of Equations (Vol. I), 3. R.M.Khan: Advanced Algebra.
				Unit – VI Inequality: A.M. ≥ G.M. ≥ H.M. and its generalisations like the theorem of weighted means and m-th power theorem, Cauchy’s inequality and their direct applications.	04.03.17 – 18.03.17	9		
		II	Analytical Geometry of Two Dimensions	Unit – I Transformation of rectangular axis - Translations, rotation and their combination.	28.09.16 – 05.10.16	4	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Warking	1. K. C Pal: Analytical Geometry, 2. Arun Kumar Mandal: A text book of Advanced Analytical Geometry, 3. U. Chatterjee & N. Chatterjee: Analytical Geometry, 4. Bej & Mukherjee: Analytical Geometry,
				Unit – II General equation of second degree in two variables and its reduction to canonical equations, classifications of conics.	01.11.16 – 08.11.16	4		
				Unit – III Pairs of straight lines, angle between two lines given by $ax^2 + 2hxy + by^2 = 0$. Angle bisector, equation of two lines joining the origin to the points in which a line meets a conic.	09.11.16 – 16.11.16	4		
				Unit – IV Condition that the general equation of second degree in two variables may represent two straight lines. Point of intersection of two intersecting straight lines.	19.11.16 – 30.11.16	5		

Year	Pass/Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
1 st	Hons	II	Analytical Geometry of Two Dimension	Unit – V Pole and polar, conjugate points, conjugate lines, conjugate diameters.	25.01.17 – 08.02.17	6	<ul style="list-style-type: none"> ❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working. 	1. K. C Pal: Analytical Geometry, 2. Arun Kumar Mandal: A text book of Advanced Analytical Geometry, 3. U. Chatterjee & N. Chatterjee: Analytical Geometry, 4. Bej & Mukherjee: Analytical Geometry,
				Unit – VI Polar equation of straight lines and circles. Polar equation of a conic referred to a focus as pole, equation of tangent, normal, chord of contact.	11.02.17 – 01.03.17	9		

➤ **PART – II**

Year	Pass/Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Hons	III	Analytical Geometry of Three Dimensions	Unit – I Rectangular cartesian co-ordinates in space, Concept of a geometric vector (directed lines segment). Projection of a vector on a co-ordinate axis, inclination of a vector with an axis, co-ordinates of a vector,	27.09.16 – 01.10.16	3	<ul style="list-style-type: none"> ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working. 	1. K. C Pal: Analytical Geometry, 2. . R.M.Khan: Advanced Geometry, 3. Chakravorty & Ghosh: Advanced Analytical Geometry.
				Unit – II Direction cosines of a vector, distance between two points. Division of a directed line segment in a given ratio, the equation of a surface and the equation of a curve.	04.10.16 – 06.10.16	3		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Hons	III	Analytical Geometry of Three Dimensions	Unit – III Equation of plane: General, intercept and normal form. The sides of a plane, signed distance of a point from a plane. Equation of a plane passing through the intersection of two planes.	01.11.16 – 04.11.16	4	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. K. C Pal: Analytical Geometry, 2. . R.M.Khan: Advanced Geometry, 3. Chakravorty & Ghosh: Advanced Analytical Geometry. 4. . Arun Kumar Mandal: A text book of Advanced Analytical Geometry, 5. U. Chatterjee & N. Chatterjee: Analytical Geometry, 6. Bej & Mukherjee: Analytical Geometry,
				Unit – IV Angle between two intersecting planes, bi-sectors of angle between two intersecting planes, Parallelism and perpendicularity of two planes.	05.11.16 – 10.11.16	4		
				Unit – V Straight line in space: its equation in symmetrical (canonical) and parametric forms. Direction ratio and direction cosines, canonical equation of the line of intersection of two intersecting planes.	10.11.16 – 17.11.16	6		
				Unit – VI Angle between two lines. Condition for Parallelism and perpendicularity of two straight lines, of a straight line and a plane, Equations of skew lines, Distance of a point from a straight line. Shortest distance between two skew lines.	17.11.16 – 24.11.16	7		
				Unit – VI Sphere, Cone, Cylinder. Surface of revolution, Ruled surface: study of their shape and canonical equations.	12.01.17 – 27.01.17	11		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Hons	III	Analytical Geometry of Three Dimensions	Unit – VII Enveloping cone and enveloping cylinder. Tangents, tangent planes, normals and generating lines of quadrics.	28.01.17 – 07.02.17	7	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example,	1. K. C Pal: Analytical Geometry, 2. . R.M.Khan: Advanced Geometry, 3. Chakravorty & Ghosh: Advanced Analytical Geometry.
				Unit – VIII Transformation of rectangular axes: translation, rotation and their combinations. General equation of second degree in three variables: reduction to canonical (normal) forms. Classification of quadrics and their equation in canonical forms.	09.02.17 – 16.02.17	7		
		IV	Analytical Statics	Unit – I Friction: Laws of Friction, Angle of friction, Cone of friction. To find the positions of equilibrium of a particle lying on a (i) rough plane curve, (ii) rough surface under the action of any given forces.	30.08.16 – 03.09.16	5	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. L. Loney: An Elementary Treatise on Statics. 2. A. S. Ramsey: Statics. 3. M. C. Ghosh: Analytical Statics. 4. S. Mondal: Analytical Statics.
				Unit – II Astatic Equilibrium, Astatic Centre. Positions of equilibrium of a particle lying on a smooth plane curve under action of given forces. Action at a joint in a frame work.	03.09.16 – 10.09.16	7		
				Unit – III Virtual work: Principle of virtual work for a single particle. Deduction of the conditions of equilibrium of a particle under coplanar forces from the principle of virtual work. The principle of virtual work for a rigid body.	15.09.16 – 20.09.16	4		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Hons	IV	Analytical Statics	Unit – IV Forces which do not appear in the equation of virtual work. Forces which appear in the equation of virtual work. The principle of virtual work for any system of coplanar forces acting on a rigid body. Converse of the principle of virtual work.	22.09.16 – 24.09.16	5	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. L. Loney: An Elementary Treatise on Statics. 2. A. S. Ramsey: Statics. 3. M. C. Ghosh: Analytical Statics. 4. S. Mondal: Analytical Statics.
				Unit – V Centre of Gravity: General formula for the determination of C.G. Determination of position of C.G. of any arc, area of solid of known shape by method of integration.	16.02.17 – 23.02.17	7		
				Unit – VI Stable and Unstable equilibrium. Co-ordinates of a body and of a system of bodies. Field of forces. Conservative field. Potential energy of a system.	25.02.17 – 02.03.17	5		
				Unit – VII The energy test of stability. Condition of stability of equilibrium of a perfectly rough heavy body lying on fixed body. Rocking stones.	03.03.17 – 09.03.17	6		
				Unit – VI Forces in three dimensions. Moment of a force about a line. Axis of a couple. Resultant of any two couples acting on a body. Resultant of any number of couples acting on a rigid body.	10.03.17 – 11.03.17	3		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Hons	IV	Analytical Statics	Unit – VII Reduction of a system of forces acting on a rigid body. Resultant force in an invariant of the system but the resultant couple is not an invariant.	14.03.17 – 16.03.17	3	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. L. Loney: An Elementary Treatise on Statics. 2. A. S. Ramsey: Statics. 3. M. C. Ghosh: Analytical Statics. 4. S. Mondal: Analytical Statics.
				Unit – VIII Conditions of equilibrium of a system of forces acting on a body. Deductions of the conditions of equilibrium of a system of forces acting on a rigid body from the principle of virtual work	17.03.17 – 18.03.17	3		
				Unit – IX Poinsot's central axis. A given system of forces can have only one central axis. Wrench, Pitch, Intensity and Screw. Condition that a given system of forces may have a single resultant. Invariants of a given system of forces. Equation of the central axis of a given system of forces.	21.03.17 – 24.03.17	4		
		V	Metric Space	Unit – I Definition and examples of metric spaces such as R^n ($n \geq 1$), l_∞ , l_p , $C[a,b]$. Open and closed ball, Neighborhoods of a point, open set, closed set.	12.08.16 – 19.08.16	7		
				Unit – II Union and intersection of open and closed sets, limit point of a set, interior point and interior of a set, boundary points and boundary of a set, elementary properties of interior	20.08.16 – 27.08.16	6		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Hons	V	Metric Space	Unit – III Closure and boundary of a set, bounded set, distance between a point and a set, distance between two sets.	22.12.16 – 24.12.16	5	❖ Questioning – Answering, ❖ Problem Solving, ❖ Board Working ❖ Lecture	1. E. T. Copson: Metric spaces. 2. Malik and Arora: Mathematical Analysis. 3. P. K. Jain and K. Ahmed: Metric Spaces.
				Unit – IV Sub-space of a metric space, sequence, convergence sequence, Cauchy sequences. Complete and incomplete metric spaces completeness of R^n ($n \geq 1$), $C[a,b]$. Cantor's intersection theorem.	03.01.17 – 12.01.17	8		
			Complex Analysis	Unit – I Complex numbers as ordered pairs. Geometrical representation of complex numbers. Extended Complex plane. Stereographic projection.	25.11.16 – 01.12.16	6	❖ Questioning – Answering, ❖ Problem Solving, ❖ Board Working ❖ Lecture	
				Unit – II Complex functions: Limit, Continuity and differentiability of complex functions. Cauchy - Riemann Equations in Cartesian and Polar forms.	02.12.16 – 08.12.16	6		
				Unit – III Analytic functions. Sufficient conditions of Differentiability (Statement only), Harmonic function. Conjugate harmonic function, statement of Milne's Method.	09.12.16 - 20.12.16	9		

➤ **PART -III**

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
3 rd	Hons	VI	Rigid Dynamics	<u>Unit – I</u> Moment and product of inertia, Momental ellipsoid, Equipomental system, Principal axis, D’Alembert’s principle. D’Alembert’s equations of motion.	15.12.16 – 23.12.16	6	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. L. Loney: An Elementary Treatise on the Dynamics of a Particle and of Rigid Bodies. 2. Chakraborty and Ghosh: Advanced Algebra Dynamics. 3. Mollah: Rigid Dynamics. 4. A.S.Ramsey: Rigid Dynamics.
				<u>Unit – II</u> Principles of moments, Principles of conservations of linear and angular momentum. Independence of the motion of centre of inertia and the motion relative to the centre of inertia. Principle of energy. Principle of conservation of energy.	03.01.17 – 10.01.17	7		
				<u>Unit – III</u> Equation of motion of a rigid body about a fixed axis. Expression for kinetic energy and moment of momentum of a rigid body moving about a fixed axis.	12.01.17 – 17.01.17	4		
				<u>Unit – IV</u> Compound pendulum. Interchangeability of the points of a suspension and centre of oscillation. Minimum time of oscillation. Reaction of axis of rotation.	19.01.17 – 27.01.17	6		
				<u>Unit – V</u> Equations of motion of a rigid body moving in two dimensions. Expression for kinetic energy and angular momentum about the origin of a rigid body moving in two dimensions.	31.01.17 – 07.02.17	5		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
3 rd	Hons	VI	Rigid Dynamics	<u>Unit – VI</u> Two dimensional motion of a solid of revolution down a rough inclined plane. Necessary and sufficient condition for pure rolling. Two dimensional motion of a solid of revolution moving on a rough horizontal plane.	09.02.17 – 16.02.17	6	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. L. Loney: An Elementary Treatise on the Dynamics of a Particle and of Rigid Bodies. 2. Chakraborty and Ghosh: Advanced Algebra Dynamics. 3. Mollah: Rigid Dynamics. 4. A.S.Ramsey: Rigid Dynamics.
				<u>Unit – VII</u> Equations of motion under impulsive forces. Equation of motion about a fixed axis under impulsive forces. Centre of percussion.	16.02.17 – 23.02.17	5		
				<u>Unit –VIII</u> To show that (i) if there is a definite straight line such that the sum of the moments of the external impulses acting on a system of particles about it vanishes, then the total angular momentum of the system about that line remains unaltered.	23.02.17 – 28.02.17	3		
				<u>Unit – IX</u> To show that (ii) the change of K.E. of a system of particles moving in any manner under the application of impulsive forces is equal to the work done by the impulsive forces. Impulsive forces applied to a rigid body moving in two dimensions.	01.03.17 – 03.03.17	3		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
3 rd	Hons	VI	Discrete Mathematics	Unit – I Sets and Propositions: Cardinality, principle of inclusion and exclusion, connectives, Tautology and contradictions, equivalence formula.	09.08.16 – 16.08.16	4	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. Lipschutz and M. L. Lipson: Discrete Mathematics. 2. R. Johnsonbaugh : Discrete Mathematics. 3. J. K. Sharma: Discrete Mathematics. 4. R. J. Wilson: Introduction to Graph Theory. 5. Babu Ram: Discrete Mathematics.
				Unit – II Graph Theory: Graphs: undirected graphs, Directed graphs, basic properties, complete graph, complement of a Graph.	23.08.16 – 30.08.16	4		
				Unit – III Bipartite Graphs, Necessary and Sufficient condition for a Bipartite Graph, Weighted Graphs.	06.09.16 – 20.09.16	4		
				Unit – IV Walk, Path, Cycles, Circuit, Euler Graph, Konisberg Bridge Problem.	27.09.16 – 04.10.16	4		
				Unit – V Trees: Basic properties, spanning tree.	01.11.16 – 08.11.16	4		
				Unit – VI Partial order relations and Lattices: Definitions of poset, lattice, chain and anti- chain, properties of a lattice, distributive lattice with properties.	15.11.16 – 29.11.16	6		
				Unit – VII Discrete numeric functions and generating functions.	06.12.16 – 20.12.16	4		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
3 rd	Hons	VIII	Numerical Analysis	Unit – I Basic concepts: approximation of numbers, significant figures, absolute, relative and percentage errors, truncation and round off errors, accumulation and propagation of errors.	11.08.16 – 12.08.16	3	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. S. Sastri : Numerical Analysis. 2. N. Datta and R.N. Jana: An introduction to Numerical Analysis. 3. S. A. Mollah: Numerical Analysis and Computational Procedures. 4. M. Pal: Numerical Analysis for Scientists and Engineers.
				Unit – II Polynomial interpolation and application: Lagrangian interpolation problem. Linear interpolation formula. Lagrange’s formula.	18.08.16 – 26.08.16	4		
				Unit – III Differences: Forward, backward and divided difference tables, linear difference equations with constant coefficients. Newton’s general interpolation formula with remainder term.	01.09.16 – 08.09.16	4		
				Unit – IV Newton’s forward and backward formulae, error in these formulae. Numerical differentiation based on Newton’s forward and backward formulae.	08.09.16 – 16.09.16	5		
				Unit – V Numerical integration: Newton’s Cotes formulae, trapezoidal rule, Simpson’s one- third rule and inherent errors, Weddle’s rule, Summation of finite series by Euler- Maclaurin series (statement only).	22.09.16 – 03.11.16	6		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books	
3 rd	Hons	VIII	Numerical Analysis	Unit – VI Solution of equations : Solution of a single equation by – Graphical method, Method of bisection, Regula falsi method, Fixed point iteration method, Newton-Raphson method. Geometrical interpretation of these methods. Convergence of fixed-point iteration and Newton-Raphson method.	03.11.16 – 18.11.16	8	❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working	1. S. S. Sastri : Numerical Analysis. 2. N. Datta and R.N. Jana: An introduction to Numerical Analysis. 3. S. A. Mollah: Numerical Analysis and Computational Procedures. 4. M. Pal: Numerical Analysis for Scientists and Engineers.	
				Unit – VII Gauss-elimination, Gauss-Siedal method for the solution of a system of linear equations.	24.11.16 – 01.12.16	4			
				Unit –VIII Solution of differential equations: Solution of a first order differential equation by Euler's method and modified Euler's method. Runga-Kutta (2nd and 4th order) methods (emphasizing the problem only).	01.12.16 – 09.12.16	5			
			Computer Practical (Using FORTRAN)	Unit – I Problems on matrices (i) Addition and subtraction, (ii) Product, (iii) Trace and (iv) Transpose.	13.08.16 – 10.09.16	5	Board Working		1. D. M. Etter: Structured FORTRAN 77 for Engineers and Scientists. 2. M. Pal : FORTRAN 77 with Numerical and Statistical Analysis. 3. C. Xavier: FORTRAN 77 and Numerical Methods.
				Unit – II Problems on strings (i) Counting of words in a string, (ii) Palindrome testing, (iii) Conversion from upper case to lower case and lower case to upper case,	24.09.16 – 19.11.16	5			

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
3 rd	Hons	VIII	Computer Practical (Using FORTRAN)	Unit – III Problems on strings (iv) Sorting of names, (v) Rewrite name of a person in short form, (vi) Searching a sub-string among a set of strings.	26.11.16 – 24.12.16	5	Board Working	1. D. M. Etter: Structured FORTRAN 77 for Engineers and Scientists. 2. M. Pal : FORTRAN 77 with Numerical and Statistical Analysis. 3. C. Xavier: FORTRAN 77 and Numerical Methods.
				Unit – IV Problems on Numerical Methods (i) Interpolation by Lagrange’s and Newton forwards difference methods, (ii) Finding of roots by bisection, regula-falsi, fixed point iteration and Newton- Rapshon methods, (iii) Integration by trapezoidal and Simpson 1/3 rule, (iv) Solution of a system of equations by Gauss-Siedal method, (v) Solution of a differential equation by Runge- Kutta methods.	07.01.17 – 04.03.17	9		

MOYNA COLLEGE

DEPARTMENT OF MATHEMATICS

Teaching Plans of Tamal Kanti Kar for Session 2016 - 17

(GENERAL)

➤ PART - I

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
1 st	Pass	I	Analytical Geometry of Two & Three Dimensions	Unit – I Two dimensions: Transformations of rectangular axes: Translation, rotation and their combinations.	10.08.16 – 17.08.16	2	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. K. C Pal: Analytical Geometry, 2. Arun Kumar Mandal: A text book of Advanced Analytical Geometry, 3. Bej & Mukherjee: Analytical Geometry, 4. Chakravorty & Ghosh: Analytical Geometry.
				Unit – II General equation of second degree in two variables and its reduction to canonical (normal) forms. Classification of conics and their equations in canonical forms.	24.08.16 – 31.08.16	2		
				Unit – III Pairs of straight-lines: Condition that the general equation of second degree may represent two straight lines. Point of intersection of two intersecting straight lines, angle and angle bisectors between two lines given by $ax^2 + 2hxy + by^2 = 0$. Equations of two straight lines joining the origin to the points in which line meets a conic.	07.09.16 – 28.09.16	4		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
1 st	Pass	I	Analytical Geometry of Two & Three Dimensions	Unit – IV Polar equations of straight lines and circles, Polar equation of a conic referred to a focus as pole, equations of chord; tangent and normal.	05.10.16 – 16.11.16	4	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. K. C Pal: Analytical Geometry, 2. Arun Kumar Mandal: A text book of Advanced Analytical Geometry, 3. Bej & Mukherjee: Analytical Geometry, 4. Chakravorty & Ghosh: Analytical Geometry.
				Unit – V Three dimensions: Rectangular Cartesian co-ordinates in space, the concept of a geometric vector. Projections of a vector on co-ordinate axes, Division of a line segment in a given ratio, direction cosines, and direction ratios of a straight line. Angle between two straight lines. Area of a triangle. The equation of a surface and the equation of a curve.	30.11.16 – 14.12.16	3		
				Unit – VI Equation of a plane: General form, intercept and normal form, angle between two planes, signed distance of a point from a plane.	21.12.16 – 11.01.17	3		
				Unit – VII The straight line in space: Its equation in symmetric (canonical) and parametric forms. Conditions for the parallelism and the perpendicularity of two planes, of two straight lines and of a straight line and a plane, Distance between two skew straight lines, coplanarity of two straight lines.	18.01.17 – 22.02.17	5		
				Unit – VIII The sphere, tangent and normal. The cone. The cylinder.	08.03.17 – 22.03.17	4		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Pass	II	Differential Calculus	Unit – I Concept of rational number, Irrational number, Real number.	17.08.16 – 31.08.16	3	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. Differential Calculus: Das and Mukherjee. 2. Shanti Narayan: Differential Calculus. 3.S.K.Mapa: Real Analysis. 4.Maity & Ghosh: Differential Calculus.
				Unit – II Sequence of numbers, concept of limit of a sequence, Null sequence, Bounded sequence, Monotonic sequence, supremum and infimum of a sequence; A convergent sequence is bounded and has a unique limit, Bounded and monotonic sequence is convergent. Statement of the theorems on limits of sequence, Cauchy sequence, Statement of Cauchy’s general principle of convergence, simple problem.	07.09.16 – 28.09.16	4		
				Unit – III Infinite series of constant term: Definition of convergence and divergence, Cauchy’s convergence Principle (application only), Geometric series and p-series and their convergence (Only statement). Series of non-negative terms: Statement of comparison test. D’ Alembert ratio test, Cauchy’s nth root test and Raabe’s test. Simple applications.	05.10.16 – 16.11.16	4		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Pass	II	Differential Calculus	Unit – IV Function of a single real variable defined on an interval, their graphs, Algebra of limits and continuity (no proof). Definition and acquaintance (no proof required) with the properties of continuous function on closed intervals, statement and existence of inverse function of a strictly monotonic function and its continuity.	30.11.16 – 21.12.16	4	<ul style="list-style-type: none"> ❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working. 	1. Differential Calculus: Das and Mukherjee. 2. Shanti Narayan: Differential Calculus. 3.S.K.Mapa: Real Analysis. 4.Maity & Ghosh: Differential Calculus.
				Unit – V Derivatives - its geometric and physical interpretation, rule of differentiation. Differential its geometrical interpretation and application in finding approximations, relation between continuity and derivability.	04.01.17 – 11.01.17	3		
				Unit – VI Successive derivatives, Leibnitz theorem: increasing and decreasing functions, sign of the derivatives, statement of Rolle’s Theorem and its geometrical interpretation. Mean value theorems of Lagrange’s, its geometrical interpretation, Cauchy’s mean value theorem. Taylor’s and Maclaurin’s theorems with Cauchy’s and Lagrange’s form of remainder (statement only). Expansion in power of x with infinite series for such functions as $\exp(x)$, $\sin(x)$, $\cos(x)$, $(1+x)^n$, $\log(1+x)$ (with restrictions wherever necessary). Indeterminate form, L’Hospital’s rule, maxima and minima.	18.01.17 – 03.02.17	5		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Pass	II	Differential Calculus	Unit – VII Function of two variables, their geometrical interpretation, limit, repeated limit and continuity (definitions and examples only). Partial differentiation, knowledge of chain rules, Exact differential, Differentiation of implicit functions, successive partial derivatives, statement of Schwarz's theorem on the commutative property of mixed partial derivative, Euler's theorem on a homogeneous function of two variables.	08.02.17 – 22.02.17	5	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. Differential Calculus: Das and Mukherjee. 2. Shanti Narayan: Differential Calculus. 3.S.K.Mapa: Real Analysis. 4.Maity & Ghosh: Differential Calculus.
				Unit – VII Applications: Problem on (i) Tangent and normals. (ii) Rectilinear asymptotes of algebraic curves, (iii) Curvature and radius of curvature of plane curves, (iv) Envelope of family of straight lines.	01.03.17 – 24.03.17	8		

Year	Pass/ Hons	Paper	Subject	Subject Contains	Duration of Teaching	No. of Classes	Teaching methods	Reference Books
2 nd	Pass	III	Numerical Analysis	Unit – I Polynomial interpolation and applications: Lagrangian interpolation problem. Linear interpolation formula. Lagrange’s formula	12.08.16 – 26.08.16	3	❖ Lecture, ❖ Questioning – Answering, ❖ Problem Solving, ❖ Illustrate with Example, ❖ Board Working.	1. N. Datta and R.N. Jana: An introduction to Numerical Analysis. 2. S. A. Mollah: Numerical Analysis and Computational Procedures. 3. M. Pal: Numerical Analysis for Scientists and Engineers. 4.A.R.Vashishtha: Numerical Analysis.
				Unit – II Differences: Forward, backward and divided difference tables. Newton’s general interpolation formula with the remainder term, Newton’s forward and backward formulae, error in these formulae, Numerical differentiation based on Newton’s forward and backward formulae.	02.09.16 – 04.11.16	5		
				Unit – III Numerical integration: Newton’s-Cotes formula, trapezoidal rule, Simpson’s one- third rule and inherent errors.	11.11.16 – 25.11.16	3		
				Unit – IV Solution of equations (algebraic and transcendental) : Solution of a single equation by (i) Graphical method. (ii) Bisection method. (iii) Regula falsi method. (iv) Iteration method. (v) Newton-Raphson method. Geometrical interpretation of these methods. Convergence of Iteration- and Newton- Raphson method.	02.12.16 – 23.12.16	4		

THANK YOU