AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR (PUNJAB)

DESCRIPTION OF PROGRAMME OUTCOMES

NAME OF THE DEAPRTMENT: Physical Sciences

NAME OF THE PROGRAMME:B.Sc. (Nonmedical /Computer Science)

P.O. No.	*Description of Programme Outcome*	*Domain as per Bloom's Taxonomy*	*Level of Bloom Taxonomy**
PO-1	**Basic Scientific Knowledge:** Acquired the knowledge With facts and figures related to various subjects in pure sciences.	Cognitive	1,2,3,4,5,6

PO-2	**Communication skills:** Build the skills of speak, write, read and listen	Psychomotor	1,2,3
PO-3	**Ethics:** Adapt scientific conduct and ethical responsibilities.	Affective	1,2,3,4
PO-4	**Life-long learning:** Engaged in Life-long learning with changing environment and positive attitude**.**	Affective	1,2,3,4,5
PO-5	**Social Contribution and Social Responsibility:** Apply scientific theories and their relevancies in day to day life.	Affective	**4,5,6**
PO-6	**Team Work:** Execute the knowledge in various fields of science and work as a team**.**	Psychomotor	1,2,3,4
PO-7	**Personality development:** Accumulate,management,principles and apply these to develop overall	Affective	1,2

	personality.		
PO-8	**Leadership skills:** To cultivating a conductive environment, effective leadership quality and attributes to achieve the goals of organization.	Psychomotor	2,3,4
PO-9	**Problem solving skills:** Identify, analyze,evaluate and apply information scientifically to solve problems.	Affective	4,5,6
PO-10	**Environment, Sustainability and Diversity:** Develop flair by participating in various social and cultural activities voluntarily.	Cognitive	2,3
PO-11/ PSO1	**Critical thinking:** Working on the critical thinking and the scientific knowledge to design carryout, record and analyze the results of chemical reactions.	Cognitive	1,2,3,4,5,6
PO-12/PSO2	**Modern Tool Usage:** Learn the laboratory skills needed to design, safely and interpret different	Psychomotor	1,2,3,4,5,6

	instruments.		
PO-13/ PSO3	**Project management:** Demonstrate the knowledge of managing a project in multi disciplinary environment.	Cognitive	1,2,3,4,5,6
PO-14/ PSO4	**Employability skills:**Inculcate skills to excel in the fields of science, information technology and its related fields.	Psychomotor	1,2,3,4,5,6
PO-15/ PSO5	**Computing and technology**: Create ideas and solutions to existing problems in modern day issues with latest trends in computing.	Cognitive	1,2,3,4,5,6

*Thesesixlevelsare:(1)knowledge(2)comprehension,(3)application,(4)analysis,(5) synthesis,and(**6**)evaluation

PO1-10GENERIC

PO11-15SPECIFICorPSO

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNJAB	
DESCRIPTION OF COURSE OUTCOMES	
NAME OF THE DEPARTMENT**:** Mathematics	
NAME OF THE PROGRAMME: M.Sc. II (SEM-3)	
NAME OF COURSE : Fuzzy sets and applications	
NAME OF FACULTY : AP Rajinder Kaur	

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain Fuzzy numbers, Linguistic variables and Fuzzy equations.	Tests/ Class Assignments Class
CO-2	State crisp and Fuzzy applications.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Deduce the compatibility and odering relations.	Group discussion
CO-4	Compute Possibility theory.	Authentic problem Solving/ Group Discussion
CO-5	Analyse the uncertainty and Non specificity of fuzzy.	Class Assignment/ Seminar/ Group Discussion
CO-6	Acquire the applications of fuzziness of fuzzy sets and fuzzy logic.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Mathematics
NAME OF THE PROGRAMME: M.Sc.II
NAME OF COURSE : Category theory –I (SEM-3)
NAME OF FACULTY : AP Kirandeep Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain definations of Category theory and tge category of Modules.	Tests/ Class Assignments Class
CO-2	Compute the product of two categories, Dual categories and Arrow Category.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Write the uniqueness upto isomorphism, examples of products viz. Hom- sets, Covarient functors.	Group discussion
CO-4	Deduce the duality principle and coproduct of monoids of abelian groups.	Authentic problem Solving/ Group Discussion
CO-5	Explore tge properties of pull back and direct limit of groups.	Class Assignment/ Seminar/ Group Discussion
CO-6	State the concept of cartesian closed categories, stone duality and ultra filter in Boolean Algebra.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**:** Mathematics

NAME OF THE PROGRAMME: M.Sc. II (SEM-4)

NAME OF COURSE : Mathematical Methods

NAME OF FACULTY : AP Sanjivani

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain the linear Integral equation of first and second kind.	Tests/ Class Assignments Class
CO-2	Derive the relation between linear differential equation and Volterra's equation.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Deduce volterra's equation and Volterra's solution of fredholm equation.	Group discussion
CO-4	Explore the properties of Simple variational problems.	Authentic problem Solving/ Group Discussion
CO-5	the concept of Euler's equation and invarience of euler's equation.	Class Assignment/ Seminar/ Group Discussion
CO-6	Compute fixed end point problem for unknown functions.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES

NAME OF THE DEPARTMENT**:** Mathematics

NAME OF THE PROGRAMME: M.Sc. II (SEM-4)

NAME OF COURSE : Optimization Techniques-II
NAME OF FACULTY : AP Rupinder Kaur

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Compute Wolfe's modified simplex method, Beale's method and Convex programming.	Tests/ Class Assignments Class
CO-2	Solve problems related to lemke's complementary pivoting algorithm, Seperable programming algorithm.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Introduce the components of decision theory.	Group discussion
CO-4	Solve the geometric programming problem.	Authentic problem Solving/ Group Discussion
CO-5	Explore the properties of simulation and its advantages and disadvantages.	Class Assignment/ Seminar/ Group Discussion
CO-6	Analyse the problems of Goal programming.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT: Mathematics
NAME OF THE PROGRAMME: M.Sc. II (SEM-4)
NAME OF COURSE : Category theory -II
NAME OF FACULTY : AP Kirandeep Kaur

C.O. No.	Description of Course	Method/s of Assessment

	Outcome	
CO-1	Define functor category and natural isomorphism	Tests/ Class Assignments Class
CO-2	Compute Bifunctor lemma, Fubtor categories and Eauivalences.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Deduce the pointer set and partial maps, slice categories and indexed families.	Group discussion
CO-4	State the Yoneda embedding, Yoneda Lemma and applications.	Authentic problem Solving/ Group Discussion
CO-5	Explain Adjunction between categories, left and right adjoints.	Class Assignment/ Seminar/ Group Discussion
CO-6	Use the triangle identities, Monads and Algebras for monads.	Class Assignment/ Group Discussion/ Authentic problem solving

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNJAB
DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Mathematics
NAME OF THE PROGRAMME: M.Sc. II (SEM-4)
NAME OF COURSE : Non-linear programming
NAME OF FACULTY : AP Rajinder Kaur

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Define Non -linear programming and its examples.	Tests/ Class Assignments Class

CO-2	Derive Constraind and unconstrained problems with equality and inquality constraint.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Deduce Fibonacci search, Golden section and Rosen brock search method .	Group discussion
CO-4	Compute Newton Raphson, Quadratic and Cubic Interpolation method.	Authentic problem Solving/ Group Discussion
CO-5	Explore the properties of Constrained optimization problem.	Class Assignment/ Seminar/ Group Discussion
CO-6	Solve Marquardt's method, parten method.	Class Assignment/ Group Discussion/ Authentic problem solving

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNJAB
DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Mathematics
NAME OF THE PROGRAMME: M.Sc. II (SEM-4)
NAME OF COURSE : Analytic Number Theory
NAME OF FACULTY : AP Raveena Saini

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Explain Arithmetic functions, Euler's totient function.	Tests/ Class Assignments Class
CO-2	Deduce big oh notation, Asymptotic equality function.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Compute partial sum of	Group discussion

	drichlet product.	
CO-4	State Shapiro's Tauberian theorem.	Authentic problem Solving/ Group Discussion
CO-5	Explore the elementry properties of groups.	Class Assignment/ Seminar/ Group Discussion
CO-6	Analyse Asymptotic formula for partial sums.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Mathematics
NAME OF THE PROGRAMME: M.Sc. II (SEM-3)
NAME OF COURSE : Differential Manifolds
NAME OF FACULTY : AP Rupinder Kaur

C.O. No.	**Description of Course Outcome**	**Method/s of Assessment**
CO-1	Define Differentiable Manifolds and its examples.	Tests/ Class Assignments Class
CO-2	Compute the differentiable map on manifolds.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Explore the properties of Lie bracket of vector fields and Integral curves.	Group discussion
CO-4	State the concept of torsion tensor and curvature tensor of a connection.	Authentic problem Solving/ Group Discussion
CO-5	Discuss the Binachi's identities	Class Assignment/ Seminar/

	and christoffel Symbols.	Group Discussion
CO-6	Acquire the knowledge of Gauss wringarten formulae and their applications.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Mathematics
NAME OF THE PROGRAMME: M.Sc. II (SEM-3)
NAME OF COURSE : Field Theory
NAME OF FACULTY : AP Sanjivani

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Define Field and examples of fields.	Tests/ Class Assignments Class
CO-2	Explain the concept of Einstein criterion and Krnoker's theorem.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Discuss Lagrange's theorem on primitive elements.	Group discussion
CO-4	Analise the fixed fields and Automorphism groups.	Authentic problem Solving/ Group Discussion
CO-5	Explore the properties of radicals and fixed fields.	Class Assignment/ Seminar/ Group Discussion
CO-6	Explain Ruler and compass construction.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Mathematics
NAME OF THE PROGRAMME: M.Sc. II (SEM-3)
NAME OF COURSE : Optimization Technique-I
NAME OF FACULTY : AP Raveena Saini

C.O. No.	Description of Course Outcome	Method/s of Assessment
CO-1	Explore the properties of LPP and Properties of duality by using suitable theorems.	Tests/ Class Assignments Class
CO-2	Use the strategies for game theory for maximum minimum principle concept of dominace.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Demonstrate the methods to understand the complimentary slackness theorem and duality theorems.	Group discussion
CO-4	Deduce suitable theory to understand initial basic feasible solution using North West Corner and Least Cost Method.	Authentic problem Solving/ Group Discussion
CO-5	Compute Mathematical formulation of Assignment problem, unbalanced problem and Salesman Problem.	Class Assignment/ Seminar/ Group Discussion
CO-6	State Discrete changes in the cost vector, Requirement	Class Assignment/ Group Discussion/

	vector and coefficient matrix, Deletion of variable and addition of variable.	Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT: MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem1)
NAME OF COURSE : Algebra
NAME OF FACULTY : A.P Rajinder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Compare and contrast about the fundamental theorem of finitely generated abelian groups, homomorphism between two cyclic groups.	Class Tests/ Class Assignments
CO-2	Increase the knowledge of groups, subgroups ,semi-group, monoid ,quasi groups	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Explain about the permutation group ,clan-equation, alternating group and their simplicity	Group discussion
CO-4	Define about Sylow's group, Sylow's theorem, Ideals, matrix ring and their ideals.	Authentic problem Solving/ Group Discussion
CO-5	Improve the Knowledge for normal Subgroup, cyclic groups and apply these results for on different examples.	Class Assignment/ Seminar/ Group Discussion
CO-6	Ability to understand a large class of commutative rings by regarding them as quotients of polynomial rings by suitable	Class Assignment/ Group Discussion/ Authentic problem solving

	ideals.	

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem1)
NAME OF COURSE : Differential geometry
NAME OF FACULTY : A.P Sanjivani

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain the basic concept and results related to space curves ,tangents , normal and surfaces.	Class Tests/ Class Assignments
CO-2	Explain the geometry of different types of curves and space.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Enhance the knowledge how to solve the Gaussian and mean curvatures.	Group discussion
CO-4	Utilize geodesics it's all related properties and theorems.	Authentic problem Solving/ Group Discussion
CO-5	Determine principal directions of curvature, asymptotic lines and then apply their important theorems and results to study various properties of curves and surfaces.	Class Assignment/ Seminar/ Group Discussion
CO-6	Explain the codazzi –Mainardi equation and compact surface of constant Gaussian curvature.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem1)
NAME OF COURSE : Mathematical Analysis
NAME OF FACULTY : A.P Rupinder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Apply the knowledge of concepts of mathematical analysis in order to theoretical development of differential mathematical techniques and their applications.	Class Tests/ Class Assignments
CO-2	State the nature of abstract mathematics and explore the concept in further solution.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Identify challenging problems in taylor's theorem and find their appropriate solution	Group discussion
CO-4	Deal with axiomatic structure of measurable spaces and generalised the properties of measure and lebesque measure.	Authentic problem Solving/ Group Discussion
CO-5	Use theory of vitali lemma and dini derivative in solving different problems.	Class Assignment/ Seminar/ Group Discussion
CO-6	Extend their Knowledge of mathematical analysis for further exploration of the subject for	Class Assignment/ Group Discussion/ Authentic problem solving

| | going into research. | |

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT: MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem1st)
NAME OF COURSE : Topology 1st
NAME OF FACULTY : A.P Raveena Saini

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Develop the concepts of topological space and basic definitions of open sets, neighbourhood, interior, exterior, closure and their axioms for defining topological space.	Class Tests/ Class Assignments
CO-2	Explain the concepts of base and sub base, create new topological space by using subspace.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Define the continuous map, restriction of domain and range, piecewise definition of map's and neighbourhood finite families.	Group discussion
CO-4	Analyse Row point of space are separated by open sets , housdroff spaces and their importance	Authentic problem Solving/ Group Discussion
CO-5	Compare and contrast the Cartesian product spaces and image of connected sets.	Class Assignment/ Seminar/ Group Discussion

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-6	Apply Knowledge for solve the elementary concepts in product spaces and slices in Cartesian products.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT: MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem2nd)
NAME OF COURSE : Algebra II
NAME OF FACULTY : A.P Rajinder Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Utilize the polynomial rings UFD, Euclidean Domain, principal Ideal Domains to solve different related problem.	Class Tests/ Class Assignments
CO-2	Analyse different types of modules, sub modules, direct sum of sub modules.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Apply the Knowledge of Algebra to attain a good mathematical maturity and enables to build mathematical thinking and reasoning.	Group discussion
CO-4	Design, analyse of and implement the concepts of artinian modules, noetherian modules and artinian implies noetherian in rings.	Authentic problem Solving/ Group Discussion
CO-5	Create, select and apply	Class Assignment/ Seminar/

	appropriate algebraic structures such as Hilbert basis theorem, composition series of a module.	Group Discussion
CO-6	Get the information about the Cohen theorem , radical ideal , nil radical , Jacobson Radical and Radical of an artinian ring	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem2nd)
NAME OF COURSE : Complex Analysis
NAME OF FACULTY : A.P Sanjivani

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Know the fundamental concept of complex analysis.	Class Tests/ Class Assignments
CO-2	Explain the concept of complex integrals and apply Cauchy integral theorem and formula.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Evaluate limits and checking the continuity of complete function and apply the concept of analyticity and the Cauchy-Riemann equation. .	Group discussion
CO-4	Solve the problems using Taylor's theorem, Laurent series in an annulus.	Authentic problem Solving/ Group Discussion
CO-5	Apply the knowledge of	Class Assignment/ Seminar/

	complex to find the general definition of analytic function and analytic continuation by power series method.	Group Discussion
CO-6	Define the information about the Harmonic function on a disc and Schwarz reflection principle	Class Assignment/ Group Discussion/ Authentic problem solving

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNJAB
DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** MATHEMATICS
NAME OF THE PROGRAMME:M.Sc. 1st (Sem 2)
NAME OF COURSE :Functional Analysis
NAME OF FACULTY : A.P Kirandeep Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain the fundamental concept of functional analysis and their role in modern mathematics	Class Tests/ Class Assignments
CO-2	Analyse the concept of functional analysis for example continuous and bounded operators, normed spaces and Hahn –branch theorem in linear spaces.	Class Assignment/ Home Assignment/Authentic problem solving
CO-3	Apply the Hahn –branch theorem in normed linear space and its applications, the open multiplying theorem projections on Branch –spaces,	Group discussion

	closed graph theorem.	
CO-4	Explain the concepts of orthogonality, orthonormal sets and Bessel's inequality.	Authentic problem Solving/ Group Discussion
CO-5	Design the conjugate space of a Hilbert spaces and develop the information about the ad joint operators, self –ad joint operators, normal and unitary operators.	Class Assignment/ Seminar/ Group Discussion
CO-6	Demonstration the nature of Brower's fixed point theorem, schauder fixed point theorem and Picard's theorem.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEAPRTMENT: MATHEMATICS
NAME OF THE PROGRAMME:M.Sc. 1st (sem2nd)
NAME OF COURSE : Topology II
NAME OF FACULTY : A.P Raveena Saini

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Deduce the knowledge of higher separation Axioms for example Regular , completely Regular, normal and completely normal space	Class Tests/ Class Assignments
CO-2	Explain the metric spaces or completely , normal T2 spaces , urysohans lemma and fietze extension theorem	Class Assignment/ Home Assignment/Authentic problem solving

C.O. No.		Description of Course Outcome	Methods of Assessment
CO-3		Analyse about embedding of tichonou space into parallel tope and stone cech compactification.	Group discussion
CO-4		Apply knowledge for solve identification topology identification map, subspace, general theorem	Authentic problem Solving/ Group Discussion
CO-5		Compare and contract about the categories and fun tars.	Class Assignment/ Seminar/ Group Discussion
CO-6		Define about the category h top, homotopy equivalence, null homotopy and invariance of path components under homotopy type.	Class Assignment/ Group Discussion/ Authentic problem solving

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DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** MATHEMATICS
NAME OF THE PROGRAMME: M.Sc. 1st (sem2nd)
NAME OF COURSE : Differential equation 1
NAME OF FACULTY : A.P Rajinder kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Explain about the existence of solution of ordinary differential equation of first order, initial value problem, as coli lemma.	Class Tests/ Class Assignments
CO-2	Deduce the information about Cauchy peano existence theorem and method of	Class Assignment/ Home Assignment/Authentic problem solving

	successive approximations	
CO-3	Analyse about system of differential equations, nth order differential equation and existence and uniqueness of solutions.	Group discussion
CO-4	Define linear system of equation both homogenous and non homogenous.	Authentic problem Solving/ Group Discussion
CO-5	Evaluate the able liouville formula and floquet theory	Class Assignment/ Seminar/ Group Discussion
CO-6	Demonstrate the orthogonality of characteristic functions and expansion of a function a series of orthonormal functions.	Class Assignment/ Group Discussion/ Authentic problem solving

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE BELA ROPAR PUNJAB
DESCRIPTION OF COURSE OUTCOMES
NAME OF THE DEPARTMENT**:** Department of computer science
NAME OF THE PROGRAMME: M.Sc. Mathematics-1st(sem1st)
NAME OF COURSE : Introduction to computers and c language
NAME OF FACULTY : AP Taranjeet Kaur

C.O. No.	Description of Course Outcome	Methods of Assessment
CO-1	Describe the basic concepts and the applications of computer systems	MST, CLASS TEST, GD
CO-2	Demonstrate the concept of input and output devices of	MST, ASSIGNMENT, PPT

	Computers	
CO-3	Define the anatomy related to networks, operating system and problem solving	MST, PPT, CLASS TEST, ASSIGNMENT
CO-4	Discuss about the logic building used in programming	MST, ASSIGNMENT, CLASS TEST, LAB WORK
CO-5	Generate algorithms writing skills for solving various real-life problems	MST, LAB WORK, PPT, VIVA
CO-6	Convert the algorithms into computer programs using C language.	MST, LAB WORK, CLASS TEST

| | | | | | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PO13 | PO14 | PO15 |

AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE, BELA RUPNAGAR PUNJAB
MAPPING OF PROGRAM OUTCOME VERSUS COURSE OUTCOME
INTERNAL QUALITY ASSURANCE CELL

NAME OF DEPARTMENT :MATHEMATICS

NAME OF PROGRAMME : M.Sc. 2nd

NAME OF COURSES : DIFFERENTIABLE MANIFOLDS -MM601, FIELD THEORY -MM602,CATEGORY THEORY I -604 OPTIMIZATION TECHNIQUES-I MM610,OPTIMIZATION TECHNIQUES-I MM610

CORRELATION LEVEL:1,2, and 3;1-SLIGHT (LOW); 2-MODERATE (MEDIUM) 3- HIGH   MENTION GAP ANALYSIS AT THE END

S.NO	Year	Semester	Name of Course/Code		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
1			DIFFERENTIABLE MANIFOLDS -MM601	CO1	3	1	2	3	3	2	1		2	3	3	3	2	2	3
				CO2	3		2	3	3	2	2	3	2	3	3	3	2	3	3
				C03	3	2	2		3	1	3	3	2	3	3	3	3	2	2
				CO4	2	1	1			1	1	2	1	2	3	3	2	3	2
				CO5	3	1	1	2	1			2	3	1	2	2	3	3	3
				CO6	3	1	2			2		1		3		1	3	3	3

#	Year	Sem	Course	CO															
2	2019-20	3rd	FIELD THEORY -MM602	CO1	3	2	1	2	3		1	2	2	3	2	2	2	3	3
				CO2	2	3	2			1	1	3		2	2	3	3	3	3
				C03	2	3	2	2	2	3	3				2	2	2	2	2
				CO4	3		2	3	3	3	3	3			2	3		3	3
				CO5	2	3		1		1		2		2	2	2	2	3	
				CO6	2	3	1		3		3		2		3	3	3	3	3
3			CATEGORY THEORY I -604	CO1	2	2		3		2		2	3	2	3	3	3	2	2
				CO2	3	2	3		1		1		2		2	2	3	2	2
				C03	2	1	3	1	3			2	2	2	3		3	3	3
				CO4	2	1	2	1	2			2		3		3	3	1	3
				CO5	3	2	2	1		1	2	1	2	2	1	3	3	3	3
				CO6	2	2	3	2	2	2	2	3	3	3	3	3	2	2	
4			OPTIMIZATION TECHNIQUES-I MM610	CO1	2	3	2	1	2	1	1		2		2	2	3	2	3
				CO2	2	2	2		2	1	3	2	1	1	2	2		2	2
				C03	2	3	2	1	2	1	2			3	3		3	3	3
				CO4	2	3	2		2	2	2		3	2	2	2		2	2
				CO5	2	2	3	2		2	2		2	3	3		3	3	3
				CO6	3		2	2	2	1	2	1		3	3	2	3	1	3
5			FUZZY SETS AND APPLICATIONS-MM611	CO1	3	3	2	3	2		3	2	1	2	3	3	3	3	3
				CO2	3	3	3	1	1	2	2	3	3	3	3	3	3	3	3
				C03	3	2	2		1	1	1				3	3		3	

Sr	Year	Sem	Course	CO															
				CO4	2	2	2	1				2	3	3	3	3	3	3	3
				CO5	3	3	3		2	3		3	3	3	2	2	1	3	
				CO6	3		2	1			3		1	3				3	3
6			THEORY OF LINEAR OPERATOR -MM702	CO1	2	2	2			3	2	1	2	2	2	3	3	3	3
				CO2	2	2	2	3	2	1	1		2	3	3	3	3	3	3
				C03	2	3	1	1	1	1	1		2	2	3	3	2	1	1
				CO4	2	3	2		3	2		3		2	2	2	2	2	2
				CO5	2	3		1	1	3		1		2	3	3	3	3	3
				CO6	2	3		3	3	3	2		2	1		2	3	3	3
7			CATEGORY THEORY -II- MM704	CO1	3	1	2	3	3	2	1		2	3	3	3	2	2	3
				CO2	3		2	3	3	2	2	3	2	3	3	3	2	3	3
				C03	3	2	2		3	1	3	3	2	3	3	3	3	2	2
				CO4	2	1	1			1	1	2	1	2	3	3	2	3	2
				CO5	3	1	1	2	1			2	3	1	2	2	3	3	3
				CO6	3	1	2			2		1		3		1	3	3	3
8	2019-20	4th	OPTIMIZATION TECHNIQUES-II MM 705	CO1	3	2	1	2	3		1	2	2	3	2	2	2	3	3
				CO2	2	3	2			1	1	3		2	2	3	3	3	3
				C03	2	3	2	2	2	3	3				2	2	2	2	2
				CO4	3		2	3	3	3	3	3			2	3	3	3	3
				CO5	2	3		1		1		2		2	2	2	2	3	3
				CO6	2	3	1		3		3		2		3	3	3	3	3

				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
9			**CO1**	2	2		3		2		2	3	2	3	3	3	2	2
		NON LINEAR PROGRAMMING -MM713	**CO2**	3	2	3		1		1		2		2	2	3	2	2
			C03	2	1	3	1	3			2	2	2	3		3	3	3
			CO4	2	1	2	1	2			2		3		3	3	1	3
			CO5	3	2	2	1		1	2	1	2	2	1	3	3	3	3
			CO6	2	2	3	2	2	2	2	3	3	3	3	3	2	2	2
10			**CO1**	2	3	2	1	2	1	1		2		2	2	3	2	3
		MATHEMATICAL METHOD - MM716	**CO2**	2	2	2		2	1	3	2	1	1	2	2	3	2	2
			C03	2	3	2	1	2	1	2			3	3		3	3	3
			CO4	2	3	2		2	2	2		3	2	2	2		2	2
			CO5	2	2	3	2		2	2		2	3	3		3	3	3
			CO6	3		2	2	2	1	2	1		3	3	2	3	1	3

Attainment of PO by Direct Method

| | | | | | COURSE ATTAINMENT CALCULATION FOR ALL COURSES IN THE SEMESTER | | | | | | | | | | | | | | |

					AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL COLLEGE, ROPAR PUNJAB			
							INTERNAL QUALITY ASSURANCE CELL	
PROGRAMME: M.Sc. MATHEMATICS	SEMESTER:4th		YEAR:2nd(session2018-19)		DATE OF DECLARATION OF RESULT BY UNIVERSITY:01-09-2019			

S. N O.	NAME OF STUDE NT	CLA SS R.N O.	UNIVE RSITY R. NO.	REGISTR ATION NO.	SUBJECT 1:THEORY OF LINEAR OPERATOR(CODE:MM702)				SUBJECT 2:OPTIMIZATION TECHNIQUES(COD E:MM705)				SUBJECT3:OPER ATION RESEARCH(COD E:MM711)	SUBJECT 4:NON LINEAR PROGRAMMI NG(CODE :MM713)	SUBJECT 5:MATHEMATIC ALS METHODS(COD E:MM716)	TOTAL OF ALL SUBJECTS/C OURSES	% age/C GPA	ATTAIN MENT LEVEL
					Theo ry	Inter nal	Pract ical (If Any)	TOT AL (T+I +P)	T	I		P	TOT AL					
1	Simran jit Kaur	320 1	12801	814-13-311				B+					B+	A	A	O	8	76	
2	Manjee t Kaur	320 2	12802	811-14-161				A+					A	A+	A+	O	8.47	80.4	

	Name	Code	Roll No	Reg No															
3	Rupinder Kaur	3203	12803	4122-15-108				A			A+	A+	A+	A+			8.8	83.6	
4	Khushboo	3204	12804	814-17-508				A			B+	B+	B	A			7.2	68.4	
5	Kamalpreet Kaur	3205	12805	811-12-282				B+			C	A	B+	B+			6.8	64.6	
6	Amandeep Kaur	3207	12806	814-14-332				A			B+	A	A	A+			8	76	
7	Mandeep Kaur	3208	12807	814-14-341				A			B	B+	A	A+			7.6	72.2	
8	Sandeep Kaur	3209	12808	811-12-266				A			B	B+	B+	A+			7.4	70.3	
9	Apsana	3210	12809	814-13-329				A			B	B	B+	A+			7.2	68.4	
10	Amandeep Kaur	3211	12810	811-13-298				A+			B	B+	A	A+			7.8	74.1	
11	Rekha Singh	3212	12811	814-17-500				A			A	A	A	A+			7.83	74.3	
12	Amandeep Kaur	3213	12812	814-14-344				A+			B+	A	A	A+			7.83	74.3	
13	Harpreet Kaur	3214	12813					A			B+	A	B	A			7.4	70.3	
14	Daljit Kaur	3215	12815	811-14-578				A			B+	B+	B	A			7.2	68.4	
15	Amandeep Kaur	3216	12816	811-14-533				A			B+	A	B+	A			7.6	72.2	

								Subject 1				Subject 2			Subject 3	Subject 4	Subject 5				
1 6	Surind er Kaur	321 7	12817	811-13-300				A				B+	B+		B+	A+			7.6	72.2	
1 7	Manin der Kaur	321 8	12818	814-14-333				A+				B+	A		B+	A			7.8	74.1	
				AVERAG E	SUBJ ECT 1					SUBJECT 2			SUBJECT 3		SUBJECT 4	SUBJECT 5					

Average Attainment of PO by direct method is **72.92 %**

Attainment of PO by indirect Method

POs	DEGREE OF RELEVANCE					*% of PO	Level of attainment
	No. of 1	No. of 2	No. of 3	No. of 4	No. of 5		
1				13		80	level 3
2				10	3	84.61	level 3
3		3		5	5	78.46	level 3
4				11	2	83	level 3
5			2	9	2	80	level 3
6		3	9	1		80	level 3
7		1	2	5	5	84.61	level 3
8			1	2	10	83	level 3
9		1	5	8		85	level 3
10			9		1	78.46	level 3

Average PO attainment by indirect method= **81.714 %**

Total PO attainment (%) = (weightage: 80 %) X (Average attainment in direct method) + (weightage: 20 %) X (Average attainment in indirect method)

= (80%) X 72.92 + (20%) X 81.71

= **74.67%**

Level of Attainment = Level 3