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Affiliated to Madurai Kamaraj University

Re-Accredited with 'A++' (CGPA 3.61) by NAAC (Cycle - IV)

Mary Land, Madurai - 625018, Tamil Nadu

#### FATIMA COLLEGE (AUTONOMOUS), MADURAI – 625018

2021 - 2022

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme specific outcomes (PSOs) and Course Outcomes (COs), of the Programmes offered by the Institution.

#### NAME OF THE PROGRAMME: B. Sc Mathematics

Programme outcomes (POs)

PO1	Apply acquired scientific knowledge to solve complex issues.
PO2	Attain Analytical skills to solve complex cultural, societal and environmental issues
PO3	Employ latest and updated tools and technologies to analyse complex issues
PO4	Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.



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#### Programme specific outcomes (PSOs)

PSO 1	Gain broad knowledge and understanding in pure Mathematics and applications of Mathematics.
PSO 2	Demonstrate a computational ability and apply logical thinking skills to solve problems that can be modelled Mathematically
PSO 3	Read, understand, analyse and formulate Mathematical theorems
PSO 4	Acquire proficiency in the use of technology to assist in learning and investigating, Mathematical ideas and in problem solving.
PSO 5	Communicate Mathematical concepts accurately, precisely and effectively with clarity and coherence both verbal and in written form.



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#### **Course Outcomes (COs)**

Course Code	Course Title	Nature of the Course (Local/National/ Regional/Global)	Course Description	Course Outcomes
19M1CC1	Calculus	National	This course provides broad view on differential and integral calculus	asymptotes and curve tracing.  CO3:Construct reduction formula for trigonometric functions



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				CO1: Explain sets, relations and
				functions
			This course is	CO2: Define binomial series,
			designed to	logarithmic and exponential
			understand the	series and solve problems.
			concepts of	CO3: Identify Relations between
19M1CC2	Classical algebra	National	algebra which are	the roots and coefficients of
			useful for solving	equations.
			various real word	CO4: Explain the
			problems.	transformations of equations.
				CO5: Recognize the important
				Methods in finding roots.
				CO1: Explain various data types
			This course	and operators in C
21B1ACM1	Computer	National	provides skills in	CO2: Summarize Decision
	programming in c	National	designing and	Making Branching, looping
			writing simple p	statements and arrays
				CO3: Categorize function,



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				pointers and structures.
				CO4: Describe Strings and
				String Handling Functions.
				CO5: Create C program for real
				life problems
				CO1: Find summation of any
				series.
	Allied mathematics – i	National	This course provides the basic concepts in various branches of	CO2: Explain the concepts of
				theory of equations.
				calculate 100ts of
19M1ACP1				la constitue different
				methods.
				CO4: Expand trigonometric
				functions CO5: Apply the
				Leibnitz's theorem to find the nth
				derivative
10150000	Differential	National	This course will	CO1: Solve problems in
19M2CC3	equations	ivational	provide the	differential equations of first



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			knowledge for	order.
			solving ordinary	CO2: Classify homogeneous and
			and partial	Non homogeneous differential
			differential	equations of second order and
			equations	solve problems.
				CO3: Solve differential equation
				problems using Laplace
				transform.
				CO4: Define Partial differential
				equations and solve problems.
				CO5: Solve problems on Growth,
				decay and chemical reactions
			This course is	CO1: Solve problems on
		National	designed to make	moments, skewness, kurtosis
21M2CC4			the students	and correlation
	Statistics		understand the	CO2: Construct regression lines
			importance of	and curve equation
			statistical literacy	CO3: Explain random variables



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			in today's data	and probability density function
			rich world.	CO4: Solve problems on
				expectation.
				CO5: Define and explain
				analysis of time series and index
				numbers.
			This course	CO1: Define the features of C++
	Object oriented programming with c++	National	introduces the	supporting object-oriented
			student to object-	programming
			oriented	CO2: Describe classes and
			programming	objects
21B2ACM3			through a study of	CO3: Distinguish Constructors
			the concepts of	and Destructors and Explain
			program	overloading concepts
			specification and	CO4: Classify Inheritance in C++
			design, algorithm	CO5: Design C++ programs for
			development.	real life situations
		National	This course is	CO1: Solve problems on ages
19M1NME /	Quantitative	Ivadollai	Tillo Course Is	CO1. Solve problems on ages



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19M2NME	aptitude		designed to help	CO2: Illustrate profit and loss
			the students to	with examples CO3: Explain
			appear in	partnership and related
			competitive	problems
			examinations.	CO4: Discuss problems on time
				and work
				CO5: Solve problems on time
				and distance
				CO1: Solve linear differential
			This course	equations
	Allied mathematics –ii	National	provides the fundamentals concepts in various branches	CO2: Solve second order linear
				differential equations with
10M0ACD0				variable coefficient.
19M2ACP2				CO3: Define Laplace transform
			of Mathematics	and apply it to solve differential
				equation.
				CO4: Define Laplace transform
				and apply it to solve differential



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		<u> </u>	<u> </u>	
				equation.
				CO5: Apply line, volume and
				surface integrals to verify the
				Gauss divergence and Stoke's
				theorem.
				CO1: Classify groups and
				explain their properties
	Modern algebra	National	This course introduces the abstract concepts of modern algebra	CO2: Describe cosets and
				Lagrange's theorem
				CO3: Explain the characteristics
19M3CC5				of different types of rings and
				their properties
				CO4: Classify various types of
				ideals
				CO5: Construct polynomial
				rings over UFD
19M3CC6	Vector calculus and	National	This course emphasizes the	CO1: Explain the concept of
	fourier transforms		fundamental	differentiation of vectors
			concepts of vector	



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			calculus and	CO2: Compute divergence and
			Fourier transforms	curl of vectors
				CO3: Solve problems on line and
				surface integrals
				CO4: Compute Fourier sine and
				cosine transforms
				CO5: Describe the properties of
				Fourier transforms
				CO1: Explain Beta and Gamma
			This course deals	functions and their properties.
	Applications of calculus and differential equations	National	with applications	CO2: Solve the problems in
			of calculus and	Maxima minima of functions of
			differential	two variables.
19M3SB1			equations.	CO3: Describe trajectories and
				orthogonal trajectories.
				CO4: Solve Brachistochrone
				problems
				CO5: Discuss dynamical



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				problems with variable mass
19C3ACM1	Allied mathematics – i	National	The course develops Mathematical knowledge needed by the chemistry students.	CO1: Appraise rank of a matrix, Eigen value and Eigen vectors CO2: Obtain higher derivatives of functions CO3: Solve exact and higher order differential equations CO4: Expand trigonometric functions CO5: Define Moments, kurtosis and to apply the same
19B3ACM1	Linear programming	National	The course provides appropriate methods for the efficient computation of optimal solutions to problems which are modeled by objective function and linear	CO1: Define basic concepts of Linear Programming problems CO2: Apply various simplex methods to solve linear programming problems CO3: Construct dual problem and solve the primal problem



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			constraints	CO4: Solve transportation
				problems CO5: Distinguish
				assignment problem and
				travelling salesman problem
				CO1: Define basic concepts of
				sequences
			This course	CO2: Explain subsequences and
	Sequences and series	National	introduces the concept of sequence and series and to enable the students to understand the fundamental ideas in Real Analysis	Cauchy sequences
				CO3: Differentiate various
19M4CC7/ 19G4CC7				convergence test for series and
				use them to solve problems
				CO4: Recognize alternating,
				convergent, conditionally and
				absolutely convergent series
				CO5: Distinguish the behaviour
				of series and power series
101///000	7. 1 1	National	This course will	CO1: Define Vector Space and
19M4CC8	Linear algebra	nauonai	focus on matrix as	explain its various concepts



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			linear	CO2: Illustrate Inner Product
			transformations	Spaces
			relative to a basis	CO3: Define basic concepts of
			of a vector space	matrices and solve linear
				equations CO4: Appraise Eigen
				Value and Eigen Vectors of
				matrices
				CO5: Describe bilinear forms
				and quadratic
				CO1: Recall some expansions of
				Trigonometric functions. CO2:
			This course helps	Explain Logarithms of Complex
			the students to	Quantities.
19M4SB2/	Foundations of mathematics	National	develop their problem solving	CO3: Describe properties of
19G4SB2	mathematics		skills.	integers.
				CO4: Solve puzzles using
				Chinese Remainder Theorem.
				CO5: Analyse inequalities.



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				CO1: Describe the concepts of	
				groups, subgroups and normal	
				subgroups	
			The course	CO2: Compute the definite	
			provides the	groups, subgroups and normal subgroups CO2: Compute the definite integral and construct reduction formula. CO3: Solve differential equations using Laplace transforms. CO4: Explain the concepts of correlation, rank correlation coefficient and regression. CO5: Apply the principle of least squares to fit a straight line and parabola. CO1: Recall relations and functions	
			mathematical	formula.	
100110110	Allied mathematics	National	skills needed by	CO3: Solve differential equations	
19C4ACM2	– ii	National	the chemistry	using Laplace transforms.	
			students for	CO4: Explain the concepts of	
			advanced study.	correlation, rank correlation	
				coefficient and regression.	
				CO5: Apply the principle of least	
				squares to fit a straight line and	
				parabola.	
			This course	CO1: Recall relations and	
19B4ACM2	Algebra and graph	National	enables the	functions	
	theory	Ivational	students to have	CO2: Appraise Eigen values and E	
			better application	Vectors	



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			of abstract	CO3: Define various types of
			concepts through	graphs
			Graph Theory.	CO4: List out the characterization
				trees
				CO5: Apply different algorithms to
				the shortest path in gr
			/T/1. :	CO1: Describe fundamental
			This course	ideas and theorems on Metric
			introduces the	spaces
			basic concepts in	CO1: Describe fundamental ideas and theorems on Metric spaces CO2: Distinguish the continuity, discontinuity and uniform continuity of functions cs to CO3: Demonstrate the cand cental ideas CO4: Explain the concept of
			analysis and to	
			enable the	
19M5CC9	Real analysis	National	students to	
			understand	connectedness and its properties
			fundamental ideas	CO4: Explain the concept of
			and theorems on	compactness and their roles in
			metric spaces.	the real line
				CO5: Organize theorems in a



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		-		correct mathematical way
				CO1: Explain the concept of the
				forces and static equilibrium
				conditions
				CO2: Describe the perception of
			This course	parallel forces and moments
			describes laws,	CO3: Classify a thorough force
			principles, and	analysis of rigid bodies and
			postulates	simple structures in equilibrium
19M5CC10	Statics	National	governing the	CO4: Illustrate and give
			statics of the	examples of couples and
			system in physical	equilibrium of three forces
			reality.	acting on a rigid body
				CO5: Solve problems related to
				friction forces in various
				applications. Summarize the
				concept of equilibrium of strings
				to prepare and demonstrate the



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				models.
19M5CC11/ 19G5CC11	Linear programming		This same is	CO1: Formulate linear programming problems and solve by graphical method CO2: Classify simplex, two phase and Big - M method to solve linear programming problems CO3: Illustrate Duality in Linear programming CO4: Recognize and formulate transportation, assignment problems and find the optimal solution CO5: Define two person zero sum game, saddle point and solve problems.
19M5CC12	Graph theory	National	This course is	CO1: Define graphs and



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			designed to	operations on graphs.
			introduce the	CO2: Summarize and
			students the	understand various techniques
			basics of graph	in proving theorems on
			theory.	connectedness.
				CO3: Create examples and
				counter examples to illustrate
				Eulerian and Hamiltonian
				graphs with examples
				CO4: List out the
				characterization of trees and
				construct various matchings for
				a graph.
				CO5: Solve problems involving
				planarity and colourability.
			This course provide	CO1: Explain various data types
19M5ME1	Computer programming in c	National	skills in designing	and operators in C
1 710101011	programming in C		and writing simple	CO2: Summarize Decision



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			programs in C.	Making Branching, looping
				statements and arrays
				CO3: Categorize function,
				pointers and structures
				CO4: Describe Strings and
				String Handling Functions.
				CO5: Create C program for real
				life problems
				CO1: Explain the difference
				between crisp set and fuzzy set
			This course	theory
			discusses the	CO2: Identify the methods of
101451450	D (1 (*	National	fundamentals of	fuzzy logic
19M5ME2	Fuzzy mathematics	National	fuzzy set theory	CO3: Recognize the operations
			and fuzzy logic.	on fuzzy sets and combination of
				fuzzy operations
				CO4: Illustrate and give
				examples related to fuzzy



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				relations
				CO5: Build sufficient
				understanding of fuzzy numbers
				and $\alpha$ – cuts
				CO1: Solve problems on Data
				Interpretation
			This course helps	CO2: Identify Analogy
	Data interpretation	National	the students to prepare for competitive examinations	CO3: Classify coding and
19M5SB3	Data interpretation and analytical aptitude			Decoding
				CO4: Solving Problems using
				ven diagram
				CO5: Identify missing numbers
				and character
		National	This course	CO1: Explain the fundamentals
19M5SB4			provides important tools for ensuring	of cryptography
	Cryptography		the privacy,	CO2: Describe Security Services
			authenticity and integrity of the	CO3: Explain Symmetric Cipher
			sensitive information	Model



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19M6CC13	Complex analysis	National	involved in modern digital systems  This course provides various concepts in complex analysis of one variable	CO4: Discuss Block Ciphers CO5: Explain Block Cipher Design Principles CO1: Explain the concept of bilinear transformations. CO2: Identify continuous, differentiable and analytic functions CO3: Solve problems on complex integration CO4: Compute analytic functions in series form and
				functions in series form and classify singularities CO5: Evaluate definite integrals using Residues
19M6CC14	Dynamics	National	This course will provide a sound knowledge of the concepts and principles in	CO1: Describe the behaviour related to projectiles CO2: Apply the laws and



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			Dynamics	principles governing dynamics of
				the system in physical reality.
				CO3: Describe the collision of
				elastic bodies.
				CO4: Explain Simple harmonic
				motion and its properties.
				CO5: Explain the motion under
				the action of central forces.
				CO1: Define sequencing problem
				and apply it to solve real life
			This helps in	problems
			solving problems	CO2: Solve problems in decision
101/60015		National	in different	making
19M6CC15 O <sub>1</sub>	Operations research	National	environments that	CO3: Apply inventory control to
			needs decisions.	solve practical problems.
				CO4: Classify queuing models
				CO5: Explain CPM and PERT to
				plan schedule and control



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			/TV1.:	1 3
			This course	CO1: Define the features of C++
			introduces the	supporting object oriented
			student to object-	programming
			oriented	CO2: Describe classes and
			programming	objects
19M6ME3	Object oriented programming with	National	through a study of	CO3: Distinguish Constructors
	C++		the concepts of	and Destructors and Explain
			program	overloading concepts
			specification and	CO4: Classify Inheritance in C++
			design, algorithm	CO5: Design C++ programs for
			development.	real life situations
			The students are	CO1: Explain prime number and
			introduced about	its distributions
10160101	m1 c 1	National	the basic topics of	CO2: Define and interpret the
19M6ME4	Theory of numbers	ivational	Number Theory	concepts of divisibility, greatest
			which includes	common divisor, relatively prime
			Divisibility,	integers and Fibonacci sequence



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			Primes,	CO3: Recognize the
			Congruences,	congruences, properties of
			positive divisors,	congruences, special divisibility
			Fermat's and	tests and Chinese remainder
			Wilson's theorem,	theorem.
			Quadratic	CO4: Explain the Law of
			reciprocity.	Quadratic reciprocity, Quadratic
				Congruence with Prime and
				Composite Modulus
				CO5: Explain Fermat's theorem
				and its applications
			This course helps	CO1: Recall Posets and classify
			the students to	Lattices.
			know more about	CO2: Identify ideals and dual
19M6ME5	Lattices and boolean algebra	National	Lattices and	ideals in Lattices.
	boolean aigebra		Boolean Algebra	CO3: Classify Modular and
			and their	Distributive Lattices.
			usefulness in	CO4: Explain the concepts of



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			other areas of	Boolean Rings and Boolean
			Mathematics.	Functions
				CO5: Apply Switching Circuits
				in real life situations.
				CO1: Describe any statement
			This course	formula in normal forms
			strengthens and	CO1: Describe any statement formula in normal forms CO2: Analyse the consistency of premises CO3: Classify various functions
10160106	Discrete	atics National under some Discre	increases the understanding of some concepts in Discrete Mathematics	premises
19M6ME6	mathematics			CO3: Classify various functions
				CO4: Solve Recurrence Relations
				CO5: Distinguish Posets and
				Lattices
			This course	CO1: Solve scientific problems
			provides	using MATLAB
10MC0DE	D.C. (1.1.	National	knowledge of basic	CO2: Explain Operators in
19M6SB5	Matlab	National	concepts in	MATLAB
			MATLAB.	CO3: Apply MATLAB in Data
				Analysis



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				CO4: Construct MATLAB
				programs for Mathematical
				Calculations
				CO5: Describe MATLAB tools
				CO1: Explain the concepts of
				various combinatorial numbers
			technique of gene functions and rec	CO2: Identify solutions by the
				technique of generating
				functions and recurrence
			This course enables to study of	relation CO3: Solve problems on
10111000	Combinatorial	National	different	
19M6SB6	mathematics	National	enumeration techniques of	principle of inclusion and
			finite but large	exclusion
			sets	CO4: Identify Euler's function
				and the Menage problem
				CO5: Explain Burnside's lemma
				and solve problems on Fibonacci
				numbers



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19M1CC1	Calculus	National	This course provides broad view on differential and integral	find the n <sup>th</sup> derivative of
			calculus	CO2: Solve problems on curvature, envelopes, asymptotes and curve tracing.
				CO3:Construct reduction formula for trigonometric functions.
				CO4:Define Jacobian, double & triple integrals and apply the knowledge of change of variables to solve the problems in double and triple integrals.
				CO5:Construct Fourier series by recalling integration.
19M1CC2	Classical algebra	National	This course is	CO1: Explain sets, relations and
			designed to	functions
			understand the	CO2: Define binomial series,



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			concepts of	logarithmic and exponential
			algebra which are	series and solve problems.
			useful for solving	CO3: Identify Relations between
			various real word	the roots and coefficients of
			problems.	equations.
				CO4: Explain the
				transformations of equations.
				CO5: Recognize the important
				Methods in finding roots.
21B1ACM1	Computer	National	This course	CO1: Explain various data types
	programming in c		provides skills in designing and	and operators in C
			writing simple p	CO2: Summarize Decision
				Making Branching, looping
				statements and arrays
				CO3: Categorize function,
				pointers and structures.
				CO4: Describe Strings and
				String Handling Functions.



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				CO5: Create C program for real
				life problems
19M1ACP1	Allied mathematics	National	This course	CO1: Find summation of any
	- i		provides the basic concepts in	series.
			various branches	CO2: Explain the concepts of
			of	theory of equations.
				CO3: Calculate roots of
				equations using different
				methods.
				CO4: Expand trigonometric
				functions CO5: Apply the
				Leibnitz's theorem to find the nth
				derivative
19M2CC3	Differential	National	This course will	CO1: Solve problems in
	equations		provide the	differential equations of first
			knowledge for	order.
			solving ordinary	CO2: Classify homogeneous
			and partial	and Non homogeneous



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			differential	differential equations of second
			equations	order and solve problems.
				CO3: Solve differential equation
				problems using Laplace
				transform.
				CO4: Define Partial differential
				equations and solve problems.
				CO5: Solve problems on
				Growth,decay and chemical
				reactions
21M2CC4	Statistics	National	This course is	CO1: Solve problems on
			designed to make	moments, skewness, kurtosis
			the students	and correlation
			understand the	CO2: Construct regression lines
			importance of	and curve equation
			statistical literacy	CO3: Explain random variables
			in today's data	and probability density function
			rich world.	CO4: Solve problems on



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				expectation.
				CO5: Define and explain
				analysis of time series and index
				numbers.
21B2ACM3	Object oriented	National	This course	CO1: Define the features of C++
	programming with C++		introduces the	supporting object oriented
			student to object-	programming
			oriented	CO2: Describe classes and
			programming	objects
			through a study of	CO3: Distinguish Constructors
			the concepts of	and Destructors and Explain
			program	overloading concepts
			specification and	CO4: Classify Inheritance in C++
			design, algorithm	CO5: Design C++ programs for
			development.	real life situations
19M1NME /	Quantitative	National	This course is	CO1: Solve problems on ages
19M2NME	Aptitude		designed to help	CO2: Illustrate profit and loss
			the students to	with examples CO3: Explain



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			appear in	partnership and related
			competitive	problems
			examinations.	CO4: Discuss problems on time
				and work
				CO5: Solve problems on time
				and distance
19M2ACP2	Allied Mathematics	National	This course	CO1: Solve linear differential
	–II		provides the	equations
			fundamentals	CO2: Solve second order linear
			concepts in	differential equations with
			various branches	variable coefficient.
			of Mathematics	CO3: Define Laplace transform
				and apply it to solve differential
				equation.
				CO4: Define Laplace transform
				and apply it to solve differential
				equation.
				CO5: Apply line, volume and



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				surface integrals to verify the Gauss divergence and Stoke's theorem.
19M3CC5	Modern Algebra	National	This course introduces the abstract concepts of modern algebra	CO1: Classify groups and explain their properties CO2: Describe cosets and Lagrange's theorem CO3: Explain the characteristics of different types of rings and their properties CO4: Classify various types of ideals CO5: Construct polynomial rings over UFD
19M3CC6	Vector Calculus and Fourier Transforms	National	This course emphasizes the fundamental concepts of vector calculus and Fourier transforms	differentiation of vectors



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				CO3: Solve problems on line and
				surface integrals
				CO4: Compute Fourier sine and
				cosine transforms
				CO5: Describe the properties of
				Fourier transforms
19M3SB1	Applications of	National	This course deals	CO1: Explain Beta and Gamma
	calculus and		with applications	functions and their properties.
	differential equations		of calculus and	CO2: Solve the problems in
			differential	Maxima minima of functions of
			equations.	two variables.
				CO3: Describe trajectories and
				orthogonal trajectories.
				CO4: Solve Brachistochrone
				problems
				CO5: Discuss dynamical
				problems with variable mass
19C3ACM1	Allied mathematics	National	The course	CO1: Appraise rank of a matrix,



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	- I		develops	Eigen value and Eigen vectors
			Mathematical	CO2: Obtain higher derivatives
			knowledge needed	of functions CO3: Solve exact
			by the chemistry	and higher order differential
			students.	equations
				CO4: Expand trigonometric
				functions
				CO5: Define Moments, kurtosis
				and to apply the same
19B3ACM1	Linear Programming	National	The course	CO1: Define basic concepts of
			provides appropriate	Linear Programming problems
			methods for the	CO2: Apply various simplex
			efficient computation of	methods to solve linear
			optimal solutions	programming problems
			to problems which are modeled by	CO3: Construct dual problem
			-	and solve the primal problem
			and linear constraints	CO4: Solve transportation
				problems CO5: Distinguish



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				assignment problem and
				travelling salesman problem
19M4CC7/ 19G4CC7	Sequences And Series	National	This course introduces the concept of	CO1: Define basic concepts of
				sequences
			sequence and	CO2: Explain subsequences and
			series and to enable the	Cauchy sequences
			students to	CO3: Differentiate various
			understand the fundamental ideas	convergence test for series and
			in Real Analysis	use them to solve problems
				CO4: Recognize alternating,
				convergent, conditionally and
				absolutely convergent series
				CO5: Distinguish the behaviour
				of series and power series
19M4CC8	Linear Algebra	National	This course will focus on matrix as	CO1: Define Vector Space and
				explain its various concepts
			linear	CO2: Illustrate Inner Product
			transformations	Spaces



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			relative to a basis	CO3: Define basic concepts of
			of a vector space	matrices and solve linear
				equations CO4: Appraise Eigen
				Value and Eigen Vectors of
				matrices
				CO5: Describe bilinear forms
				and quadratic
19M4SB2/	Foundations Of	National		CO1: Recall some expansions of
19G4SB2	Mathematics		the students to develop their	Trigonometric functions. CO2.
			problem solving	Evoluin Logarithms of Complex
			skills.	Quantities.
				CO3: Describe properties of
				integers.
				CO4: Solve puzzles using
				Chinese Remainder Theorem.
				CO5: Analyse inequalities.
19C4ACM2	Allied Mathematics	National	The course	CO1: Describe the concepts of
	— II		provides the	groups, subgroups and normal



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			mather	matical		subgro	oups		
			skills	needed	by	CO2:	Compute	the	definite
			the	chemi	stry	integra	ıl and const	ruct r	eduction
			studen	its	for	formul	a.		
			advano	ced study	<b>7.</b>	CO3: S	Solve differe	ntial e	quations
						using l	Laplace tran	sform	s.
						CO4:	Explain th	e con	cepts of
						correla	tion, ran	k co	rrelation
						coeffici	ent and reg	ressio	n.
						CO5: A	Apply the pr	rinciple	e of least
						square	s to fit a st	raight	line and
						parabo	ola.		
19B4ACM2	Algebra And Graph	National	This	cot	ırse	CO1:	Recall r	elation	ns and
	Theory		enable	S	the	functio	ons		
			studen	its to 1	nave	CO2: A	Appraise Eig	gen va	lues and
			better	applica	tion	Vector	S		
			of	abst	ract	CO3:	Define var	ious	types of
			concep	ots thro	ugh	graphs	3		



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			Graph Theory.	CO4: List out the characterizati
				trees
				CO5: Apply different algorithms t
				the shortest path in gr
19M5CC9	Real Analysis	National	This course	CO1: Describe fundamental
	-		introduces the	ideas and theorems on Metric
			basic concepts in	spaces
			analysis and to	CO2: Distinguish the continuity,
			enable the	discontinuity and uniform
			students to	continuity of functions
			understand	CO3: Demonstrate the
			fundamental ideas	connectedness and its properties
			and theorems on	CO4: Explain the concept of
			metric spaces.	compactness and their roles in
				the real line
				CO5: Organize theorems in a
				correct mathematical way
19M5CC10	Statics	National	This course	CO1: Explain the concept of the



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			describes 1	laws,	forces and static equilibrium
			principles,	and	conditions
			postulates		CO2: Describe the perception of
			governing	the	parallel forces and moments
			statics of	the	CO3: Classify a thorough force
			system in phy	sical	analysis of rigid bodies and
			reality.		simple structures in equilibrium
					CO4: Illustrate and give
					examples of couples and
					equilibrium of three forces
					acting on a rigid body
					CO5: Solve problems related to
					friction forces in various
					applications. Summarize the
					concept of equilibrium of strings
					to prepare and demonstrate the
					models.
19M5CC11/	Linear Programming	National	The co	ourse	CO1: Formulate linear



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19G5CC11			appropriate	programming problems and
			methods for the efficient	solve by graphical method
			computation of optimal solutions	and
			to problems which are modeled by	1 17 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
			objective function and linear	programming problems
			constraints	CO3: Illustrate Duality in Linear
				programming
				CO4: Recognize and formulate
				transportation, assignment
				problems and find the optimal
				solution
				CO5: Define two person zero
				sum game, saddle point and
				solve problems.
19M5CC12	Graph Theory	National	This course is	CO1: Define graphs and
			designed to	operations on graphs.
			introduce the	CO2: Summarize and



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			students	the	understand various techniques
			basics of	graph	in proving theorems on
			theory.		connectedness.
					CO3: Create examples and
					counter examples to illustrate
					Eulerian and Hamiltonian
					graphs with examples
					CO4: List out the
					characterization of trees and
					construct various matchings for
					a graph.
					CO5: Solve problems involving
					planarity and colourability.
101/51/51	Computer	National	This course	provid	CO1: Explain various data types
19M5ME1	Programming In C		skills in	designii	and operators in C
			and writin	g simp	CO2: Summarize Decision
			programs in	C.	Making Branching, looping
					statements and arrays



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				CO3: Categorize function,
				pointers and structures
				CO4: Describe Strings and
				String Handling Functions.
				CO5: Create C program for real
				life problems
19M5ME2	Fuzzy Mathematics	National	This cours	e CO1: Explain the difference
	, and the second		discusses th	between crisp set and fuzzy set
			fundamentals c	f theory
			fuzzy set theor	CO2: Identify the methods of
			and fuzzy logic.	fuzzy logic
				CO3: Recognize the operations
				on fuzzy sets and combination of
				fuzzy operations
				CO4: Illustrate and give
				examples related to fuzzy
				relations
				CO5: Build sufficient



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				understanding of fuzzy numbers
				and $\alpha$ – cuts
19M5SB3	Data Interpretation and Analytical Aptitude	National	This course helps the students to prepare for competitive examinations	Interpretation CO2: Identify Analogy CO3: Classify coding and Decoding CO4: Solving Problems using
				ven diagram CO5: Identify missing numbers and character
19M5SB4	Cryptography	National	This course provides important tools for ensuring the privacy, authenticity and integrity of the sensitive information involved in modern digital systems	CO3: Explain Symmetric Cipher Model CO4: Discuss Block Ciphers



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				Design Principles
19M6CC13	Complex Analysis	National	This course	CO1: Explain the concept of
			provides various	bilinear transformations.
			concepts in	CO2: Identify continuous,
			complex analysis	differentiable and analytic
			of one variable	functions
				CO3: Solve problems on complex
				integration
				CO4: Compute analytic
				functions in series form and
				classify singularities
				CO5: Evaluate definite integrals
				using Residues
19M6CC14	Dynamics	National	This course will	CO1: Describe the behaviour
			provide a sound knowledge of the	related to projectiles
			concepts and	CO2: Apply the laws and
			principles in Dynamics	principles governing dynamics of
				the system in physical reality.



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				CO3: Describe the collision of
				elastic bodies.
				CO4: Explain Simple harmonic
				motion and its properties.
				CO5: Explain the motion under
				the action of central forces.
19M6CC15	Operations	National	This helps in	CO1: Define sequencing problem
	Research		solving problems	and apply it to solve real life
			in different	problems
			environments that	CO2: Solve problems in decision
			needs decisions.	making
				CO3: Apply inventory control to
				solve practical problems.
				CO4: Classify queuing models
				CO5: Explain CPM and PERT to
				plan schedule and control
				project activities.
19M6ME3	Object Oriented Programming With	National	This course	CO1: Define the features of C++



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	C++		introduces the	supporting object oriented
			student to object-	programming
			oriented	CO2: Describe classes and
			programming	objects
			through a study of	CO3: Distinguish Constructors
			the concepts of	and Destructors and Explain
			program	overloading concepts
			specification and	CO4: Classify Inheritance in C++
			design, algorithm	CO5: Design C++ programs for
			development.	real life situations
19M6ME4	Theory Of Numbers	National	The students are	CO1: Explain prime number and
			introduced about	its distributions
			the basic topics of	CO2: Define and interpret the
			Number Theory	concepts of divisibility, greatest
			which includes	common divisor, relatively prime
			Divisibility,	integers and Fibonacci sequence
			Primes,	CO3: Recognize the
			Congruences,	congruences, properties of



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			positive divisors,	congruences, special divisibility
			Fermat's and	tests and Chinese remainder
			Wilson's theorem,	theorem.
			Quadratic	CO4: Explain the Law of
			reciprocity.	Quadratic reciprocity, Quadratic
				Congruence with Prime and
				Composite Modulus
				CO5: Explain Fermat's theorem
				and its applications
19M6ME5	Lattices and	National	This course helps	CO1: Recall Posets and classify
	Boolean Algebra		the students to	Lattices.
			know more about	CO2: Identify ideals and dual
			Lattices and	ideals in Lattices.
			Boolean Algebra	CO3: Classify Modular and
			and their	Distributive Lattices.
			usefulness in	CO4: Explain the concepts of
			other areas of	Boolean Rings and Boolean
			Mathematics.	Functions



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				CO5: Apply Switching Circuits in real life situations.
19M6ME6	Discrete Mathematics	National	This course strengthens and increases the understanding of some concepts in Discrete Mathematics	formula in normal forms CO2: Analyse the consistency of premises CO3: Classify various functions CO4: Solve Recurrence Relations CO5: Distinguish Posets and
19M6SB5	Matlab	National	This course provides knowledge of basic concepts in MATLAB.	using MATLAB CO2: Explain Operators in



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		<u> </u>	<u> </u>	
				Calculations
				CO5: Describe MATLAB tools
19M6SB6	Combinatorial Mathematics	National	This course enables to study of different enumeration techniques of finite but large sets	CO1: Explain the concepts of various combinatorial numbers CO2: Identify solutions by the
				numbers