THE STANDARD FIREWORKS RAJARATNAM COLLEGE FOR WOMEN (AUTONOMOUS), SIVAKASI – 626 123.

(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade by NAAC, College with Potential for Excellence by UGC and Mentor Institution under UGC PARAMARSH)

DEPARTMENT OF MATHEMATICS

UG DEGREE PROGRAMME IN MATHEMATICS

SYLLABUS 2020

PROGRAMME EDUCATIONAL OBJECTIVES The Graduates will	
PEO1.	be proficient in statistical and computational skills, help them to shine in Govt./Private Sectors, Banks, Railways, IT etc.,
PEO2.	be excellent in computing ability to comprehend, analyze and design solutions for real life problems and understand the ethical ,social responsibilities.
PEO3.	attend confidently the competitive exams and entrance exams like TNPSC, SSC,RRB and TANCET/GATE etc.,

PROGRAMME SPECIFIC OUTCOMES By the Completion of B.Sc **MATHEMATICS** programme, the learners will be able to	
PSO1.	impart knowledge on the basics of core branches of Mathematics like Algebra, Analysis, Calculus, Vector Algebra, Trigonometry and Number theory.
PSO2.	formulate, convert in to mathematical modelling and apply mathematical techniques to solve problems in science and various disciplines.
PSO3.	analyse mathematical theorems and apply the concepts to arrive at solutions for real life mathematical problems.
PSO4.	communicate effectively about Mathematics to both layman and expert audiences utilizing appropriate information and communication technology.
PSO5.	work independently and collaborate effectively in team to achieve their goal
PSO6.	recognize the importance of adhering to science and its ethical values and become a responsible citizen.
PSO7.	conduct self evaluation and continuously enrich themselves through life-long learning.

COURSE OUTCOME

பகுதி– I- பொதுத்தமிழ்	
Course Code: BDGT11	**Course Title: சங்க இலக்கியமும் உரைநடையும்**
On successful completion of the course, the learners should be able to	
CO1[K2]	எழுத்திலக்கணம்,சங்க இலக்கியப்பாடல் மற்றும் கட்டுரைகளின் உட்பொருளை எடுத்துரைப்பர்.
CO2[K3]	சங்க இலக்கியப்பாடல் மற்றும் கட்டுரைகள் பதிவு செய்துள்ளஅகவாழ்வியலைச் சான்றுகளுடன் விளக்குவர்.
CO3[K4]	சங்க இலக்கியப் பாடல் மற்றும் கட்டுரைகள் பதிவுசெய்துள்ளபுறவாழ்வியலை வரிசைப்படுத்துவர்.
CO4[K4]	எழுத்திலக்கண விதிகள் மற்றும் படைப்பாளர்களின் கருத்துப் புலப்பாட்டுத் திறனை ஆய்ந்துரைப்பர்.
CO5[K5]	மக்களின் சமுதாய நிலையை இலக்கியக் கட்டுரைகளின்வழி மதிப்பிடுவர்.

PART – I – HINDI LANGUAGE COURSE	
Course Code: BDGH11	**Course Title: HINDI LANGUAGE COURSE- I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and the basics of grammar in writings
CO2[K2]	explain the renowned literary pieces
CO3[K3]	identify the techniques and writing style of writers
CO4[K4]	analyse the literary elements in the works of writers, expand proverbs
CO5[K5]	appraise the works of writers

PART – I – FRENCH LANGUAGE COURSE	
Course Code: BDGF11	**Course Title: FRENCH LANGUAGE COURSE- I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French and tell time in French.
CO2[K2]	explain the grammatical concept.
CO3[K3]	use grammar in framing questions in French.
CO4[K4]	analyse the importance of French in day to day life.
CO5[K5]	assess the usage of French grammar in a workplace.

PART II– ENGLISH	
Course Code: BDGE11	**Course Title: ENGLISH FOR COMMUNICATION - I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the content through the study of language and literature
CO2[K2]	comprehend and respond to passages, situations and texts
CO3[K3]	apply appropriate vocabulary and construct ideas
CO4[K4]	analyze the prescribed literary pieces
CO5[K5]	develop grammatical structures accurately and appraise literature

Core Course	
Course Code: BDMT11	**Course Title: CALCULUS AND TRIGONOMETRY**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of envelopes, curvature of the plane curves, hyperbolic functions and trigonometry.
CO2[K2]	construct the reduction formulae for various functions
CO3[K3]	find the area and volume of the surfaces.
CO4[K4]	simplify the problems of series involving trigonometric functions of multiple angles.
CO5[K5]	evaluate problems in Calculus.

Core Course	
Course Code: BDMT12	**Course Title: AG3D AND VECTOR CALCULUS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of analytical geometry and vector calculus.
CO2[K2]	describe about the properties of 3D space, scalar and vector valued functions.
CO3[K3]	solve problems in straight line, plane and sphere.
CO4[K4]	examine Green's, Gauss's and Stoke's theorem for vector valued functions.
CO5[K5]	evaluate the area and volume of the surfaces.

Allied Course	
Course Code: BDPH1A	**Course Title: FUNDAMENTAL PHYSICS (FOR CHEMISTRY AND MATHEMATICS)**
On successful completion of the course, the learners should be able to	
CO1[K2]	summarize the basics of photo electricity, transport properties of gases, laws and parameters involved in electricity, rotational motion and gravitational laws
CO2[K2]	explain photo electric cells, Boy's experiment, laws related to electricity and gravitation
CO3[K3]	solve simple problems related to photo electricity, kinetic theory of gases, rotational motion, electricity and gravitation
CO4[K4]	analyze photoelectricity with respect to various parameters, 'g' using compound pendulum and compare the variation of 'g' with respect to latitude,depth and altitude
CO5[K5]	evaluate transport properties of gases, gravitational parameters, electric field for different charge distributions and parameters of rotational motion

VALUE ADDED COURSES	
Course Code: BDES11	**Course Title: ENVIRONMENTAL STUDIES**
On successful completion of the course, the learners should be able to	
CO1[K2]	recognize the importance of environment and role of individual in its protection.
CO2[K2]	represent the primary environmental problems and its potential solutions.
CO3[K3]	utilize the methods for the sustainable use of natural resources.
CO4[K4]	organize an action plan for sustainable alternatives that integrate science, humanist and social perspectives
CO5[K4]	compare the structure and functions of ecosystems in the context of human-environmental interactions.

பகுதி - I -பொதுத்தமிழ	
Course Code: BDGT21	**Course Title: அற இலக்கியமும்தன்முன்னேற்றக் கட்டுரைகளும்**
On successful completion of the course, the learners should be able to	
CO1[K2]	அறஇலக்கியங்களில் இடம்பெற்றுள்ளஅறக்கருத்துக்களையும் வாழ்வியல் முன்னேற்றச்சிந்தனைகளையும்எடுத்துரைப்பர்.
CO2[K3]	சொல்லின்வகைகளையும்அதன்இலக்கணத்தையும்இப்பாடத்தோடுதொடர்புடைய இலக்கியவரலாற்றையும்சான்றுகளுடன்விளக்குவர்.
CO3[K4]	தனிமனித மற்றும் சமூக வாழ்வியலில் மக்கள்பின்பற்றவேண்டியஅறங்களை அடையாளப்படுத்துவர்.
CO4[K4]	வாழும்போதேசரித்திரம்படைத்தவர்களின்சாதனைகளைவரிசைப்படுத்துவர்.
CO5[K5]	வாழ்வில்முன்னேற்றம்பெறுவதற்கானவழிமுறைகளைமதிப்பிடுவர்.

PART – I – HINDI LANGUAGE COURSE	
Course Code: BDGH21	**Course Title: HINDI LANGUAGE COURSE- II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and the basics of grammar in writings.
CO2[K2]	explain the renowned literary pieces, describe tourist spots and the methods to write letters.
CO3[K3]	identify the techniques and writing style of writers.
CO4[K4]	analyse the literary elements in the works of writers.
CO5[K5]	appraise the works of writers.

PART – I – FRENCH LANGUAGE COURSE	
Course Code: BDGF21	**Course Title: FRENCH LANGUAGE COURSE- II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French.
CO2[K2]	explain the grammatical concept.
CO3[K3]	use grammar in framing questions in French .
CO4[K4]	analyse the importance of French in day to day life.
CO5[K5]	assess the usage of French grammar in everyday life.

PART II– ENGLISH	
Course Code: BDGE21	**Course Title: ENGLISH FOR COMMUNICATION- II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the content through the study of language and literature.
CO2[K2]	comprehend and respond to passages, situations and texts.
CO3[K3]	apply appropriate vocabulary and construct ideas.
CO4[K4]	analyze the prescribed literary pieces.
CO5[K5]	develop grammatical structures accurately and appraise literature.

Core Course	
Course Code: BDMT21	**Course Title: THEORY OF EQUATIONS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of theory of equations.
CO2[K3]	solve equations by using relation between roots and coefficients.
CO3[K3]	apply computational techniques to find the solution of the equation.
CO4[K4]	analyze the equation for its nature, position and roots.
CO5[K5]	evaluate the roots of the cubic equation.

Core Course	
Course Code: BDMT22	**Course Title: NUMERICAL METHODS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain basic concepts and its properties of algebraic, transcendental, simultaneous equations, difference operator, interpolation, numerical differentiation /integration, Solving Ordinary Differential Equations
CO2[K3]	Apply iterative methods to determine approximate solution for any type of equation.
CO3[K3]	compute numerical differentiation / integration for any function /data and find numerical solution of Ordinary Differential Equations by applying various methods.
CO4[K4]	analyze data using numerical methods to obtain approximate solution for the given problem.
CO5[K5]	evaluate missing data for real life problems through interpolation.

Allied Course	
Course Code: BDPH2A1	**Course Title: DIGITAL ELECTRONICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic principles in digital systems.
CO2[K2]	describe logic gates, karnaugh map, flip flops, and arithmetic circuits.
CO3[K3]	apply digital logic principles to simplify simple circuits, convert number system and codes.
CO4[K4]	analyze circuits for various arithmetic and logic operations.
CO5[K5]	the functioning of gates, combinational logic circuits, number systems and flip flops.

Allied Course	
Course Code: BDPH2AL	**Course Title: FUNDAMENTAL PHYSICS LAB (FOR B.Sc MATHEMATICS AND CHEMISTRY)**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the principle of the experiment
CO2[K3]	construct electronic and electrical circuits
CO3[K3]	determine the physical parameters by performing the experiments.
CO4[K4]	analyze the physical parameters both manually and graphically
CO5[K5]	evaluate the obtained results following the laboratory ethics

VALUE ADDED COURSE	
Course Code: BDVG21	**Course Title: VALUE EDUCATION & GENDER STUDIES**
On successful completion of the course, the learners should be able to	
CO1[K1]	recall the basic concepts of various categories of value education and gender studies
CO2[K2]	outline the principles of personal, family, professional and societal values
CO3[K2]	explain strategies that can attain ethical-moral values, gender variations and gender equality
CO4[K4]	examine the multifaceted dimensions of women's role in the society with moral values and ethics
CO5[K4]	analyze the elements of gender studies associated with values for peaceful and contented life

ABILITY ENHANCEMENT COURSE - SKILL BASED COURSE	
Course Code: BDCL23	**Course Title: INTRODUCTION TO COMPUTERS & MS OFFICE**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the components of computer and basics of office automation software
CO2[K2]	summarize the features of windows operating system and PC software
CO3[K2]	demonstrate the working of windows operating system
CO4[K3]	utilize the word features for document creation
CO5[K4]	analyze the commands for simple visual presentations

PART V	
Course Code: BDSA2	**Course Title: SOCIAL AWARENESS PROGRAMMES & PHYSICAL EDUCATION**
On successful completion of the course, the learners should be able to	
CO1[K3]	identify their interest, leadership skills and undertake challenges.
CO2[K3]	adapt to work in teamand communicate effectively with the society
CO3[K3]	instill a sense of responsibility on environmental issues and conservation of nature
CO4[K6]	develop the habit of creating awareness on health for society
CO5[K6]	build up a positive image of women with self-confidence and self-awareness.

பகுதிI - பொதுத்தமிழ்	
Course Code: BDGT31	**Course Title:** சமய இலக்கியமும் நாடகமும்
On successful completion of the course, the learners should be able to	
CO1[K2]	சமய இலக்கியங்கள் மற்றும் நாடகங்கள் புலப்படுத்தும் கருத்துக்களையும் செய்யுள் யாப்பு மரபுகளையும் எடுத்துரைப்பர்
CO2[K3]	இறையடியார்கள் இறைவனைப் போற்றும் மரபினை அடையாளப்படுத்துவர்.
CO3[K4]	அடியவர்கள் இறைவனை வேண்டும் மரபினையும் அவர்களது இலக்கியங்களில் இடம்பெற்றுள்ள புராணக் கருத்துக்களையும் ஆய்ந்தறிவர்.
CO4[K4]	சமய இலக்கியங்கள் உணர்த்தும் இறை மற்றும் தத்துவச் சிந்தனைகளை ஆராய்வர்.
CO5[K5]	சமய இலக்கியங்கள் மற்றும் நாடகங்களின் பொருண்மைகளை மதிப்பிடுவர்.

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PART – I – HINDI LANGUAGE COURSE	
Course Code: BDGH31	**Course Title: HINDI LANGUAGE COURSE- III**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and poetics
CO2[K2]	explain the renowned literary pieces and describe factual reports for everyday life
CO3[K3]	identify the techniques and writing style of writers
CO4[K4]	analyse the literary elements in the works of writers
CO5[K5]	appraise the works of writers

PART – I – FRENCH LANGUAGE COURSE	
Course Code: BDGF31	**Course Title: FRENCH LANGUAGE COURSE- III;**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French.
CO2[K2]	explain the grammatical concept,express their feelings and opinions in French.
CO3[K3]	use grammar in framing correct sentences.
CO4[K4]	analyse the importance of French in day to day life.
CO5[K5]	assess the usage of French grammar in everyday life.

PART II– ENGLISH	
Course Code: BDGE31	**Course Title: ENGLISH FOR ENRICHMENT - I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the content through the study of language and literature.
CO2[K2]	comprehend and respond to passages, situations and texts.
CO3[K3]	apply appropriate vocabulary and construct ideas.
CO4[K4]	analyze the prescribed literary pieces.
CO5[K5]	develop grammatical structures accurately and appraise literature.

Core Course	
Course Code: BDMT31	**Course Title: MECHANICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts & principles of statics and dynamics
CO2[K3]	apply the geometrical arguments for proving the results in Mechanics.
CO3[K3]	solve problems in Forces acting at a point, Moments, Friction, Projectiles and Collision using the laws and theorems.
CO4[K4]	analyze the mechanism of physical problems.
CO5[K5]	evaluate resultant of any number of forces acting on a particle in real life problems.

Core Course	
Course Code: BDMT32	**Course Title: DIFFERENTIAL EQUATIONS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of ODE, PDE and Laplace transforms.
CO2[K3]	apply the concepts of first order differential equation in solving real life problems.
CO3[K3]	solve the ODE and simultaneous linear differential equations by using Laplace transforms.
CO4[K4]	examine the different forms of ODE and PDE for finding the solutions.
CO5[K5]	evaluate problems of ODE and PDE.

Allied Course	
Course Code: BDMT3A	**Course Title: PROGRAMMING IN C& C++**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of C and C++.
CO2[K3]	apply decision making, looping, branching statements, structure, union, constructor and destructor to create simple programs.
CO3[K3]	identify various dimensional arrays, string handling and user defined functions.
CO4[K4]	analyze the concept of various types of operator overloading and inheritance.
CO5[K5]	choose appropriate OOPs structure for solving real life problems.

Allied Course	
Course Code: BDMT3AL	**Course Title: PROGRAMMING IN C & C++ LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain conditional, control making statements and OOPs for solving problems.
CO2[K3]	develop programming skills.
CO3[K4]	analyze the concepts of functions, structures, constructor and overloading.
CO4[K5]	deduct and rectify errors in programs..
CO5[K6]	create programs for real life situation.

பகுதிI - பொதுத்தமிழ்	
Course Code: BDGT41	**Course Title: கவிதை இலக்கியமும் சிறுகதையும்**
On successful completion of the course, the learners should be able to	
CO1[K2]	இலக்கியங்களின் உட்பொருளினைஎடுத்துரைப்பர்.
CO2[K3]	இலக்கியவரலாறு,அணிவகைகளின் இலக்கணத்தையும்,கலைச்சொற்களின் பொருளையும் அடையாளப்படுத்துவர்.
CO3[K3]	இலக்கியப் படைப்புகளில் பதிவாகியுள்ளசமூகச் சிந்தனைகளைக் கட்டமைப்பர்.
CO4[K4]	இலக்கியங்கள் புலப்படுத்தும் மனிதநேயக் கருத்துக்களைஆராய்வர்
CO5[K5]	இலக்கியப் படைப்புகளில் இடம்பெறும் மாந்தர்களின் பண்புநலன்களைமதிப்பிடுவர்.

PART – I – HINDI LANGUAGE COURSE	
Course Code: BDGH41	**Course Title: HINDI LANGUAGE COURSE- IV**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and the history of Hindi Literature
CO2[K2]	explain the renowned literary pieces
CO3[K3]	identify the techniques and writing style of writers and demonstrate the ability to write on given topics
CO4[K4]	analyse the literary elements in the works of writers
CO5[K5]	appraise the works of writers, practice the art of translation

PART – I – FRENCH LANGUAGE COURSE	
Course Code: BDGF41	**Course Title: FRENCH LANGUAGE COURSE- IV**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French .
CO2[K2]	explain the grammatical concept, express their feelings and opinions in French.
CO3[K3]	use grammar in framing correct sentences.
CO4[K4]	analyse the importance of French in day to day life.
CO5[K5]	assess the usage of French grammar in everyday life.

PART II– ENGLISH	
Course Code: BDGE41	**Course Title: ENGLISH FOR ENRICHMENT - II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the content through the study of language and literature.
CO2[K2]	comprehend and respond to passages, situations and texts.
CO3[K3]	apply appropriate vocabulary and construct ideas.
CO4[K4]	analyze the prescribed literary pieces.
CO5[K5]	develop grammatical structures accurately and appraise literature.

Core Course	
Course Code: BDMT41	**Course Title: GRAPH THEORY**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of graph theory.
CO2[K3]	apply logical argument / algorithm for proving characterization, equivalent conditions in graph theory.
CO3[K3]	solve the real life problems using graph theoretical structures.
CO4[K4]	analyze the properties of vertex and edge colouring in graphs.
CO5[K5]	prove the properties of different types of graphs.

Core Course	
Course Code: BDMT42	**Course Title: SEQUENCES AND SERIES**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of sequences and series.
CO2[K3]	develop the properties of convergent, divergent and oscillating sequences.
CO3[K3]	apply logical argument for proving characterization, equivalence criterions on various concepts of sequences and series.
CO4[K4]	analyze the behavior of series through various tests.
CO5[K5]	justify the nature of sequences.

Allied Course	
Course Code: BDMT4A	**Course Title: PROGRAMMING IN PYTHON**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the principles of Python.
CO2[K2]	Describe data types, operators, functions, tuples, dictionaries and files
CO3[K3]	use loops, functions and data types to write simple programs.
CO4[K3]	write Python program using OOPs.
CO5[K4]	analyze the process of structuring the data using Lists, Tuples and Dictionaries

Allied Course	
Course Code: BDMT4AL	**Course Title: PROGRAMMING IN PYTHON LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the structures and syntax of Python.
CO2[K3]	write programs using data types, tuples and dictionaries.
CO3[K4]	distinguish C and C++ with Python
CO4[K5]	deduct and rectify the errors in programs.
CO5[K6]	develop their programming skills.

Discipline Specific Course	
Course Code: BDMT4DSL	**Course Title: MATHEMATICA& MAPLE LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the technical codings for efficient usage of Mathematical and Maple software.
CO2[K3]	apply the suitable syntax and semantics to solve real life problems.
CO3[K3]	develop programming skills.
CO4[K4]	analyse the concepts of algebra, graph theory and differential equations
CO5[K5]	evaluate problems on integrals.

Core Course	
Course Code: GLMT51	**Course Title: REAL ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain countability, basic concepts and the properties of metric spaces.
CO2[K3]	make use of continuous functions to prove results in context of real line.
CO3[K3]	identify the behaviour of complete metric space.
CO4[K4]	analyze the characteristics and equivalent criterions of various concepts of R.
CO5[K5]	prove theorems, results and corollaries on real line.

Core Course	
Course Code: BDMT52	**Course Title: MODERN ALGEBRA**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts in Groups and Rings.
CO2[K3]	apply the logical arguments for proving the characterizations/equivalent conditions of algebraic structure.
CO3[K3]	solve problems using the results of Groups and Rings
CO4[K4]	analyze the nature and properties of Rings and Ideals.
CO5[K5]	justify the statements in Groups / Rings.

Core Course	
Course Code: BDMT5L	**Course Title: MATLAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the codings of MATLAB.
CO2[K3]	find regression lines for any bivariate data.
CO3[K3]	apply MATLAB tools for solving Mathematical problems and drawing graphs.
CO4[K4]	analyze various differential equations and find the solution.
CO5[K5]	evaluate the optimal solution of LPP and value of integral.

Elective Course	
Course Code: BDMT5E1	**Course Title: LINEAR PROGRAMMING**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain LPP, canonical & standard form, primal-dual form and sub / special classes of LPP.
CO2[K3]	apply efficient computational techniques and algorithms that are needed to solve optimization problems.
CO3[K3]	solve the balanced / unbalanced problems in sub/special classes of LPP
CO4[K4]	examine feasible, infeasible, IBFS, unbounded, degenerate/non degenerate solutions to a LPP, TP and AP.
CO5[K5]	construct mathematical formulation for real life problems.

Elective Course	
Course Code: BDMT5E2	**Course Title: FOURIER ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the expansion of periodic functions.
CO2[K3]	apply mathematical skills to construct Fourier series for any function.
CO3[K3]	develop the finite Fourier sine cosine transform
CO4[K4]	analyze the applications of Fourier integrals formula.
CO5[K6]	construct Fourier sine and cosine transform.

Elective Course	
Course Code: BDMT5E3	**Course Title: DISCRETE MATHEMATICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic principles of discrete Mathematical structures.
CO2[K3]	write the truth table for any logical statement.
CO3[K3]	identify the normal forms and quantifiers.
CO4[K4]	analyze the concept of Boolean algebra in switching circuits.
CO5[K5]	evaluate the types of Grammars and generate them for Languages.

Elective Course	
Course Code: BDMT5E4	**Course Title: MODERN APPLIED ALGEBRA**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain algebraic systems, Boolean algebra and lattice
CO2[K3]	apply algebraic structures to data communication.
CO3[K3]	solve problems in modular and geometric lattices.
CO4[K4]	analyze the concepts of coding and decoding digital informations.
CO5[K5]	evaluate problems on applied algebra.

Course Code: BDMT5V	**Course Title: INTERNSHIP/ON-THEJOB TRAINING**
On successful completion of the course, the learners should be able to	
CO1[K2]	relate the class room theory with work place practice.
CO2[K3]	apply the practices / procedures observed in real time working environment.
CO3[K4]	analyse the workflow and communication flow prevailing in the institution/industry.
CO4[K5]	assess interests and abilities in their field of study.
CO5[K6]	propose strategies, policies and guidelines for enhancing efficiency of industrial/institutional operations.

SKILL BASED COURSES	
Course Code: BDCG51	**Course Title: CAREER GUIDANCE**
On successful completion of the course, the learners should be able to	
CO1[K1]	recall the basic concepts about history, culture of India and languages.
CO2[K2]	summarize the various events related to Indian economy and Indian national movement.
CO3[K3]	explain the multi - dimensional aspects of science.
CO4[K4]	apply the mathematical knowledge to solve different problems.
CO5[K5]	analyze the problems related to mental ability and reasoning power.

Core Course	
Course Code: BDMT61	**Course Title: COMPLEX ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of complex numbers.
CO2[K3]	solve problems in context of complex numbers system.
CO3[K3]	identify the behaviour of conformal mapping and transformations.
CO4[K4]	analyze the characteristics and equivalence criterions of various concepts of complex numbers.
CO5[K5]	prove theorems, corollaries and results of complex numbers.

Core Course	
Course Code: BDMT62	**Course Title: LINEAR ALGEBRA**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of linear space and theory of matrix.
CO2[K3]	develop the properties of inner Product Spaces and bilinear forms.
CO3[K3]	Solve problems in linear algebra and compute eigen values and eigen vectors.
CO4[K4]	analyze the characteristics and equivalence criterions of linear space and matrix theory.
CO5[K5]	prove theorems, results and corollaries on linear algebra.

Core Course	
Course Code: BDMT63	**Course Title: STATISTICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain various concepts and properties of random variables, sampling techniques and various distributions.
CO2[K3]	apply t, F and χ^2 test to test significance of sampling.
CO3[K3]	solve numerous problems for any statistical data.
CO4[K4]	distinguish different types of distributions, random variables, and various tests of significance.
CO5[K5]	evaluate the significance difference through ANOVA.

Core Course	
Course Code: BDMT6L	**Course Title: R LANGUAGE LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of R language.
CO2[K3]	apply t-Test and F-Test for testing of samples.
CO3[K4]	analyze different measures of central tendencies.
CO4[K5]	evaluate correlation coefficient for any bivariate data.
CO5[K6]	develop the programming skill to solve real life problems.

Elective Course	
Course Code: BDMT6E1	**Course Title: OPERATIONS RESEARCH**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of decision making and optimization problem.
CO2[K3]	write various types of queueing models
CO3[K3]	apply quantitative technique to solve optimization problems.
CO4[K4]	examine problems on queueing theory and inventory control.
CO5[K5]	evaluate problems on sequencing and replacement of machines to make effective business decisions.

Elective Course	
Course Code: BDMT6E2	**Course Title: AUTOMATA AND FORMAL LANGUAGES**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic knowledge in automation and phrase structure grammars.
CO2[K3]	construct derivation trees.
CO3[K3]	apply the concepts in theoretical computer science.
CO4[K4]	analyze regular languages.
CO5[K5]	evaluate problems on automata and formal languages.

Allied Course	
Course Code: BDMT3A1	**Course Title: ALLIED MATHEMATICS I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamentals of ODE, PDE,Laplacetransforms.
CO2[K3]	solve problems of ODE by using Laplace transforms.
CO3[K3]	identify the methods for solving PDE.
CO4[K4]	examine the different forms of ODE for finding the solutions.
CO5[K5]	estimate the solution forscientific problems through differential equations.

Allied Course	
Course Code: BDMT4A1	**Course Title: ALLIED MATHEMATICS II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts in vector calculus and algebraic structure.
CO2[K2]	discuss properties of vector valued functions.
CO3[K3]	solve the line and surface integrals.
CO4[K4]	examine Green's, Gauss's and Stoke's theorem for vector valued functions.
CO5[K4]	the characterization and equivalence criterion of group structures.

Non-Major Elective Course	
Course Code: BDMT4N	**Course Title: STATISTICAL METHODS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of statistical constants,correlation and regression.
CO2[K2]	relate bivariate data..
CO3[K3]	solve problems in central tendency.
CO4[K3]	compute various measures of dispersion.
CO5[K4]	analyze statistical techniques to solve problems.

Non-Major Elective Course	
Course Code: BDMT5N	**Course Title: NUMERICAL METHODS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain algebraic, transcendental equations and finite difference operators.
CO2[K2]	estimate the roots of the equation using various methods.
CO3[K3]	solve problems using computational skills.
CO4[K3]	apply various methods to solve simultaneous equation.
CO5[K4]	analyze various finite difference operators.

Job oriented Course	
Course Code: BDJO66	**Course Title: CAREER MATHEMATICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	discuss basic formulae in Mathematics.
CO2[K2]	explain various verbal and non-verbal reasoning problems.
CO3[K3]	solve arithmetic problems
CO4[K3]	build their confidence level for attending competitive examinations.
CO5[K4]	analyze analytical, logical problems.

Job oriented Course	
Course Code: BDJO66L	**Course Title: CAREER MATHEMATICS LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	discuss basic formulae in Mathematics.
CO2[K2]	explain various verbal and non-verbal reasoning problems.
CO3[K3]	solve arithmetic problems.
CO4[K3]	build their confidence level for attending competitive examinations.
CO5[K4]	Analyze analytical, logical problems.

Extra credit Course	
Course Code: BDMTEC1	**Course Title: MATHEMATICS FOR CAREER BUILDING**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain basic formulae, geometric properties and results in various concepts of mathematics.
CO2[K2]	select suitable formulae and method to solve problems.
CO3[K3]	use general intelligence and aptitude skills to face all competitive examinations confidently.
CO4[K3]	solve problems effectively through appropriate method.
CO5[K4]	focus on improving the communicational and computational kills.

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DEPARTMENT OF MATHEMATICS

PG DEGREE PROGRAMME IN MATHEMATICS

SYLLABUS 2020

PROGRAMME EDUCATIONAL OBJECTIVES	
The Graduates will	
PEO1.	have the caliber to work in various colleges, universities and shine in higher level administrations like UPSC,TNPSC, IBPS, etc.,
PEO2.	have the ability to pursue Research in any branch of Mathematics, complying to ethical values.
PEO3.	develop entrepreneurial skills, to be empowered according to the professional requirement and become self-dependent.

PROGRAMME SPECIFIC OUTCOMES	
By the Completion of M.Sc MATHEMATICS programme, the learners will be able to	
PSO1.	formulate and develop mathematical arguments in a logical manner.
PSO2.	tackle complex problems, reveal structures, clarify problems, discover suitable analytic / numerical methods and interpret solutions.
PSO3.	empowered to take up academic research.
PSO4.	communicate the recent trends of Mathematics in various fields effectively.
PSO5.	work as a team member having skills for effective collaboration to ad hoc diverse purposes.
PSO6.	communicate professionally and face challenges ethically in the society.
PSO7.	recognize the need for the ability to engage in independent and life-long learning in the broadest context of emerging trends in Mathematics.

COURSE OUTCOME

Core Course	
Course Code: MDMT11	**Course Title: ALGEBRA I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts and the properties of Group and Ring theory.
CO2[K3]	apply logical proof for algebraic structures
CO3[K3]	identify the algebraic structures in solvable group.
CO4[K4]	analyze the characteristics and equivalence criterions of various concepts of algebraic structures.
CO5[K5]	prove various theorems, results and corollaries of Group and Ring theory.

Core Course	
Course Code: MDMT12	**Course Title: REAL ANALYSIS I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the topological properties, convergent, continuity and differentiability of functions defined on subsets of R.
CO2[K3]	identify the properties of metric space, sequences, series, continuity, uniform continuity and differentiation in real line.
CO3[K3]	determine the behaviour of sequences and series.
CO4[K4]	analyze the characteristics and equivalence criterions of various concepts in the context of extended real number system
CO5[K5]	prove various theorems, results and corollaries of real number system.

Core Course	
Course Code: MDMT13	**Course Title: OPERATIONS RESEARCH**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of network, algorithms of network models and classical optimization theory.
CO2[K3]	apply various network optimization algorithms to find solution for real situations.
CO3[K3]	solve constrained and unconstrained problems through optimization techniques.
CO4[K4]	analyze network problems, constrained and non constrained problems for optimum solution.
CO5[K5]	estimate time schedule, shortest duration and floating time for the project network.

Core Course	
Course Code: MDMT14	**Course Title: DIFFERENTIAL EQUATIONS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of linear and non linear differential equations.
CO2[K3]	make use of computational techniques to solve linear and nonlinear differential equations.
CO3[K3]	solve Legender, Euler and Bessel equations.
CO4[K4]	examine the differential equations for the existence of solutions.
CO5[K5]	evaluate PDE through various methods.

Core Course	
Course Code: MDMT1L	**Course Title: OPERATIONS RESEARCH LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	illustrate the basic concepts of network theory and non linear programming.
CO2[K3]	solve non–linear programming/network problems using TORA and EXCEL spread sheet.
CO3[K3]	apply algorithms to find shortest path and minimal spanning tree.
CO4[K4]	analyze time schedule by PERT and CPM.
CO5[K6]	improve computational skills in solving various discipline problems.

Core Elective Course	
Course Code: MDMT1E1	**Course Title: MATHEMATICAL MODELLING**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of mathematical models.
CO2[K3]	apply differential equation models to solve scientific problems.
CO3[K3]	construct mathematical models for solving real life problems.
CO4[K4]	classify models through various mathematical concepts.
CO5[K5]	evaluate the problems in various disciplines.

Core Elective Course	
Course Code: MDMT1E2	**Course Title: COMBINATORIAL MATHEMATICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts on Inclusion and Exclusion principles
CO2[K3]	identify contact networks and analysis of an activity network.
CO3[K3]	apply the concept of Permutations and Combinations in real life problem.
CO4[K4]	examine the concepts of Polya's counting and Generating functions.
CO5[K5]	evaluate problems in Binomial coefficients and Generating Permutations.

Core Course	
Course Code: MDMT21	**Course Title: ALGEBRA II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts in Algebra of Linear Transformations
CO2[K3]	apply the properties of Linear Transformation in theory of matrices.
CO3[K3]	identify the behaviour of trace, transpose and determinants.
CO4[K4]	analyze the characteristics and equivalence criterions of various transformations.
CO5[K5]	prove various theorems, results and corollaries of transformations.

Core Course	
Course Code: MDMT22	**Course Title: REAL ANALYSIS II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of Riemann Stieltjes integral, various functions, Lebesque Measurable sets and functions
CO2[K3]	apply the logical arguments to prove the properties of measure theory.
CO3[K3]	identify the behaviour of sequences and series of function.
CO4[K4]	analyze the characteristics and equivalence criterions of various concepts of R.
CO5[K5]	prove various theorems, results and corollaries in R.

Core Course	
Course Code: MDMT23	**Course Title: TOPOLOGY**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of topological spaces.
CO2[K3]	identify various forms of topology
CO3[K4]	classify the topological spaces by countability and separation axioms.
CO4[K4]	examine the properties of topological spaces.
CO5[K5]	prove theorems on product, metric, connected and compact spaces.

Core Course	
Course Code: MDMT24	**Course Title: ADVANCED GRAPH THEORY**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the concepts of graph theory.
CO2[K3]	apply graph theoretical knowledge to solve real life problems.
CO3[K3]	determine the Chromatic number of the graph.
CO4[K4]	analyse the properties of various graphs.
CO5[K5]	prove the theorems on numerous concepts of Graph theory.

Core Course	
Course Code: MDMT31	**Course Title: ALGEBRA III**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of theory of fields and extension fields.
CO2[K3]	apply mathematical / logical argument for proving criterions and characterizations of field theory and Galois Theory.
CO3[K3]	construct splitting field and Galois group over rationals.
CO4[K4]	examine the nature of finite fields.
CO5[K5]	prove theorems related to G (K, F), field of rational functions solvability by radicals of a polynomial.

Core Course	
Course Code: MDMT32	**Course Title: ADVANCED NUMERICAL METHODS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain various methods for solving symmetric matrices, interpolation, and differential equations.
CO2[K3]	find the exact solution for the ordinary differential equation, polynomial, trigonometric, and exponential functions.
CO3[K3]	identify the method for solving interpolation, and extrapolation.
CO4[K4]	classify the methods for solving the partial differential equation of second order.
CO5[K5]	justify the solution of various differential equations.

Core Course	
Course Code: MDMT33	**Course Title: FUNCTIONAL ANALYSIS I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of functional analysis and the properties of Normed, Banach & Dual spaces.
CO2[K3]	identify the characteristics of spectrum of a bounded linear operator.
CO3[K3]	apply the equivalence criterions on various concepts of functional analysis.
CO4[K4]	analyze the duals of $L^p([a, b])$ and $C([a, b])$.
CO5[K5]	prove/disprove theorems and results on functional analysis.

Core Course	
Course Code: MDMT34	**Course Title: INTEGRAL EQUATIONS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of Integral Equations
CO2[K3]	estimate the solution of Fredholm and Volterra Integral Equations using computational techniques.
CO3[K3]	apply various methods to find solution of Fredholm and Volterra, Integro–Differential Equations.
CO4[K4]	connect the relation between Integral and Differential Equations & Integral and Integro–Differential Equations.
CO5[K5]	evaluate problems in Integral equations.

Core Course	
Course Code: MDMT3L	**Course Title: ADVANCED NUMERICAL METHODS LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts in C and C++ program.
CO2[K3]	apply C language to solve the cubic equation.
CO3[K3]	make use of Euler's method to find the numerical solution of differential equation.
CO4[K4]	examine the solution of differential equation by Runge–Kutta method.
CO5[K6]	develop C++ program for the second order differential equations.

Core Elective Course	
Course Code: MDMT3E1	**Course Title: NUMBER THEORY & RESEARCH ETHICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain research ethics and the several basic results on Number Theory.
CO2[K3]	apply effective computational techniques / mathematical arguments for proving characterization, criterions on number theoretical concepts.
CO3[K3]	solve various types of problems in context of theory of numbers.
CO4[K4]	analyze mathematical ethics involved in various disciplines.
CO5[K5]	prove the properties of congruences and primitive roots.

Core Elective Course	
Course Code: MDMT3E2	**Course Title: ADVANCED ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of linear transformation and Differentiation.
CO2[K3]	apply differentiation and integration for functions of several variables.
CO3[K3]	make use of mathematical arguments for proving characteristics/criterions of real number system.
CO4[K4]	analyze the closed forms and exact forms.
CO5[K5]	prove/disprove theorems in Euclidean n–dimensional space (R^n).

Core Course	
Course Code: MDMT41	**Course Title: FUZZY ALGEBRA**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of fuzzy algebra.
CO2[K3]	determine fuzzy arithmetic operations and relations.
CO3[K3]	solve problems in fuzzy numbers, relations and projections.
CO4[K4]	analyze the characteristics of fuzzy set in algebraic structures.
CO5[K5]	prove the properties and characterizations of fuzzy algebra.

Core Course	
Course Code: MDMT42	**Course Title: COMPLEX ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of complex numbers & properties of analytic functions.
CO2[K3]	apply mathematical / logical arguments for proving characterizations, criterions of complex number system.
CO3[K3]	compute poles and residues of functions, line integrals and finite integrals.
CO4[K4]	examine the properties of meromorphic and entire functions.
CO5[K5]	prove theorems and results in context of complex number system.

Core Course	
Course Code: MDMT43	**Course Title: MATHEMATICAL STATISTICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamentals and properties of probability, random variable, expectations, and distribution functions.
CO2[K3]	solve various problems in special distributions.
CO3[K3]	apply computational techniques for solving problems in multivariate distributions.
CO4[K4]	analyze the behavior of limiting distributions and transformation of variables.
CO5[K5]	prove theorems and results on sampling theory.

Core Elective Course	
Course Code: MDMT4E1	**Course Title: FUNCTIONAL ANALYSIS II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the operators on Normed(Linear), Hilbert spaces and the properties of compact linear maps & bounded operators.
CO2[K3]	make use of the concept of inner product space for proving various results and properties.
CO3[K3]	apply logical argument for proving the characterizations/criterions of Normed and Hilbert spaces.
CO4[K4]	analyze spectrum of bounded and compact operators on Linear and Hilbert spaces.
CO5[K5]	prove / disprove theorems and results in context of functional analysis.

Core Elective Course	
Course Code: MDMT4E2	**Course Title: ADVANCED TOPOLOGY**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of topological spaces.
CO2[K3]	construct the mathematical arguments that relate to the study of topological spaces.
CO3[K4]	analyze the equivalence criterions of various concepts of topological spaces.
CO4[K5]	deduct the properties of topological spaces.
CO5[K5]	prove theorems on connected, compact spaces.

Core Course	
Course Code: MDMT4P	**Course Title: –PROJECT AND VIVA VOCE**
On successful completion of the course, the learners should be able to	
CO1[K2]	illustrate the mathematical concepts in the area of specialization.
CO2[K3]	develop analytic and research skills.
CO3[K4]	analyze and extend any research paper in various branches of Mathematics.
CO4[K5]	choose the area of interest for pursuing research
CO5[K6]	create new ideas in emerging trends of Mathematics.

Non-Major Elective Course	
Course Code: MDMT2E	**Course Title: OPTIMIZATION TECHNIQUES**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamentals of optimization and decision-making problems.
CO2[K3]	apply algorithm to obtain optimum solution for LPP, transportation and assignment problems.
CO3[K3]	compute solution for game theory and network problems.
CO4[K4]	analyze network and game theory problems for optimum solution.
CO5[K5]	estimate the solution for the real-life problems.

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DEPARTMENT OF MATHEMATICS

UG DEGREE PROGRAMME IN MATHEMATICS WITH COMPUTER APPLICATIONS

PROGRAMME EDUCATIONAL OBJECTIVES	
The Graduates will	
PEO1.	be excellent in teaching, programming skills and subject knowledge, take them to grow in education system and higher administrations like TNPSC, IPSC, LIC etc.,
PEO2.	construct mathematical models for real life problems and obtain solution by analytic approach and perform social, professional, ethical responsibilities.
PEO3.	explore critical thinking, programming skills in diverse areas of Mathematics and experience an environment conducive in cultivating skills for successful career entrepreneurship and higher studies.

PROGRAMME SPECIFIC OUTCOMES	
By the Completion of B.Sc Mathematics with Computer Applicatioins programme, the learners will be able to	
PSO1.	apply the knowledge in pure, applied Mathematics and programming languages to solve mathematical problems.
PSO2.	provide optimistic solutions to social life problems by applying various Mathematical methods.
PSO3.	become indepth, motivated researchers in a specific area of study with the ability to recognize and address important scientific problems.
PSO4.	communicate effectively about the different concepts of Mathematics in various disciplines.
PSO5.	collaborate effectively in a team to solve social and real life problems.
PSO6.	apply ethical principles and be committed to professional ethics & social responsibilities.
PSO7.	apply the mathematical concepts in all the fields of learning including research and recognize the need and prepare for life-long learning.

COURSE OUTCOME

பகுதி – I - பொதுத்தமிழ்	
Course Code: BDGT11	**Course Title: சங்க இலக்கியமும் உரைநடையும்**
இப்பாடத்தை முழுமையாகக் கற்றபின் மாணவியர் பெறும் திறன்கள்:	
CO1[K2]	எழுத்திலக்கணம், சங்க இலக்கியப்பாடல் மற்றும் கட்டுரைகளின் உட்பொருளை எடுத்துரைப்பர்.
CO2[K3]	சங்கஇலக்கியப்பாடல் மற்றும் கட்டுரைகள் பதிவுசெய்துள்ள அகவாழ்வியலைச் சான்றுகளுடன் விளக்குவர்.
CO3[K4]	சங்கஇலக்கியப்பாடல் மற்றும் கட்டுரைகள் பதிவுசெய்துள்ள புறவாழ்வியலை வரிசைப்படுத்துவர்.
CO4[K4]	எழுத்திலக்கண விதிகள் மற்றும் படைப்பாளர்களின் கருத்துப்புலப்பாட்டுத்திறனை ஆய்ந்துரைப்பர்.
CO5[K5]	மக்களின் சமுதாயநிலையை இலக்கியக்கட்டுரைகளின் வழி மதிப்பிடுவர்.

PART – I – HINDI LANGUAGE COURSE	
Course Code: BDGH11	**Course Title: HINDI LANGUAGE COURSE - I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and the basics of grammar in writings
CO2[K2]	explain the renowned literary pieces
CO3[K3]	identify the techniques and writing style of writers
CO4[K4]	analyse the literary elements in the works of writers, expand proverbs
CO5[K5]	appraise the works of writers

PART – I – FRENCH LANGUAGE COURSE	
Course Code: BDGF11	**Course Title: FRENCH LANGUAGE COURSE- I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French and tell time in French.
CO2[K2]	explain the grammatical concept.
CO3[K3]	use grammar in framing questions in French.
CO4[K4]	analyse the importance of French in day to day life.
CO5[K5]	assess the usage of French grammar in a workplace.

PART II– ENGLISH		
Course Code: BDGE11		**Course Title: ENGLISH FOR COMMUNICATION - I**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the content through the study of language and literature	
CO2[K2]	comprehend and respond to passages, situations and texts	
CO3[K3]	apply appropriate vocabulary and construct ideas	
CO4[K4]	analyze the prescribed literary pieces	
CO5[K5]	develop grammatical structures accurately and appraise literature	

Core Course		
Course Code: BDMC11		**Course Title: CALCULUS AND TRIGONOMETRY**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the basic concepts of envelopes, curvature of the plane curves, hyperbolic functions and trigonometry.	
CO2[K3]	construct reduction formulae for various functions.	
CO3[K3]	find the area and volume of the surfaces.	
CO4[K4]	simplify the problems of series involving trigonometric functions of multiple angles.	
CO5[K5]	evaluate problems in Calculus.	

Core Course		
Course Code: BDMC12		**Course Title: AG3D AND VECTOR CALCULUS**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the basic concepts of analytical geometry and vector calculus.	
CO2[K3]	describe about the properties of 3D space, scalar and vector valued functions.	
CO3[K3]	solve problems in straight line, plane and sphere.	
CO4[K4]	examine Green’s, Gauss’s and Stoke’s theorem for vector valued functions.	
CO5[K5]	evaluate the area and volume of the surfaces	

Allied Course	
Course Code: BDMC1A	**Course Title: STATISTICS I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the properties of statistical constants, correlation & regression and attributes.
CO2[K3]	compute central tendencies, measures of dispersion, moments, correlation and regression.
CO3[K3]	apply statistical techniques to find solution for various problems in statistics.
CO4[K4]	analyze real life problems through statistical methods.
CO5[K5]	evaluate the value of index number.

VALUE ADDED COURSES	
Course Code: BDES11	**Course Title: ENVIRONMENTAL STUDIES**
On successful completion of the course, the learners should be able to	
CO1[K2]	recognize the importance of environment and role of individual in its protection.
CO2[K2]	represent the primary environmental problems and its potential solutions.
CO3[K3]	utilize the methods for the sustainable use of natural resources.
CO4[K4]	organize an action plan for sustainable alternatives that integrate science, humanist and social perspectives.
CO5[K4]	compare the structure and functions of ecosystems in the context of human-environmental interactions.

பகுதி - I -பொதுத்தமிழ்	
Course Code: BDGT21	**Course Title: அற இலக்கியமும் தன்முன்னேற்றக் கட்டுரைகளும்**
இப்பாடத்தை முழுமையாகக் கற்றபின் மாணவியர் பெறும் திறன்கள்:	
CO1[K2]	அற இலக்கியங்களில் இடம்பெற்றுள்ள அறக்கருத்துக்களையும் வாழ்வியல் முன்னேற்றச் சிந்தனைகளையும் எடுத்துரைப்பர்.
CO2[K3]	சொல்லின் வகைகளையும் அதன் இலக்கணத்தையும் இப்பாடத்தோடு தொடர்புடையஇலக்கிய வரலாற்றையும் சான்றுகளுடன் விளக்குவர்.
CO3[K4]	:தனிமனித மற்றும் சமூக வாழ்வியலில் மக்கள் பின்பற்ற வேண்டிய அறங்களை அடையாளப்படுத்துவர்.
CO4[K4]	வாழும் போதே சரித்திரம் படைத்தவர்களின் சாதனைகளை வரிசைப்படுத்துவர்.
CO5[K5]	வாழ்வில் முன்னேற்றம் பெறுவதற்கான வழிமுறைகளை மதிப்பிடுவர்.

PART – I – HINDI LANGUAGE COURSE		
Course Code: BDGH21		**Course Title: HINDI LANGUAGE COURSE- II**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the significant contributions of the writers and the basics of grammar in writings	
CO2[K2]	explain the renowned literary pieces, describe tourist spots and the methods to write letters	
CO3[K3]	identify the techniques and writing style of writers	
CO4[K4]	analyse the literary elements in the works of writers	
CO5[K5]	appraise the works of writers	

PART – I – FRENCH LANGUAGE COURSE		
Course Code: BDGF21		**Course Title: FRENCH LANGUAGE COURSE- II**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the basic elements of grammar in French	
CO2[K2]	explain the grammatical concept	
CO3[K3]	use grammar in framing questions in French	
CO4[K4]	analyse the importance of French in day to day life	
CO5[K5]	assess the usage of French grammar in everyday life	

PART II– ENGLISH		
Course Code: BDGE21		**Course Title: ENGLISH FOR COMMUNICATION- II**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the content through the study of language and literature	
CO2[K2]	comprehend and respond to passages, situations and texts	
CO3[K3]	apply appropriate vocabulary and construct ideas	
CO4[K4]	analyze the prescribed literary pieces	
CO5[K5]	develop grammatical structures accurately and appraise literature	

Core Course	
Course Code: BDMC21	**Course Title: THEORY OF EQUATIONS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamental concepts of theory of equations.
CO2[K3]	solve equations by using relation between roots and coefficients.
CO3[K3]	apply computational techniques to find the solution of the equation.
CO4[K4]	analyze the equation for its nature, position and roots.
CO5[K5]	evaluate the roots of the cubic equation.

Core Course	
Course Code: BDMC22	**Course Title: NUMERICAL METHODS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain basic concepts and its properties of algebraic, transcendental, simultaneous equations, difference operator, interpolation, numerical differentiation /integration, solving Ordinary Differential Equations.
CO2[K3]	apply iterative methods to determine approximate solution for any type of equation.
CO3[K3]	compute numerical differentiation / integration for any function /data and find numerical solution of Ordinary Differential Equations by applying various methods.
CO4[K4]	analyze data using numerical methods to obtain approximate solution for the given problem.
CO5[K5]	evaluate missing data for real life problems through interpolation.

Allied Course	
Course Code: BDMC2A	**Course Title: STATISTICS II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of probability and sampling theory.
CO2[K3]	identify the test of significance for large and small samples.
CO3[K3]	make use of computational/ statistical skills to solve the real-life problems.
CO4[K4]	examine the nature of population by testing of hypothesis.
CO5[K5]	evaluate problems through ANOVA.

Allied Course	
Course Code: BDMC2AL	**Course Title: STATISTICS LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of R language.
CO2[K3]	apply t-Test and F-Test for testing of samples.
CO3[K4]	analyze different measures of central tendencies.
CO4[K5]	evaluate correlation coefficient for any bivariate data.
CO5[K6]	develop the programming skill to solve real life problems.

VALUE ADDED COURSE	
Course Code: BDVG21	**Course Title: VALUE EDUCATION & GENDER STUDIES**
On successful completion of the course, the learners should be able to	
CO1[K1]	recall the basic concepts of various categories of value education and gender studies
CO2[K2]	outline the principles of personal, family, professional and societal values
CO3[K2]	explain strategies that can attain ethical-moral values, gender variations and gender equality
CO4[K4]	examine the multifaceted dimensions of women's role in the society with moral Values and ethics
CO5[K4]	analyze the elements of gender studies associated with values for peaceful and contented life

ABILITY ENHANCEMENT COURSE - SKILL BASED COURSE	
Course Code: BDCL23	**Course Title: INTRODUCTION TO COMPUTERS & MS OFFICE**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the components of computer and basics of office automation software
CO2[K2]	summarize the features of windows operating system and PC software
CO3[K2]	demonstrate the working of windows operating system
CO4[K3]	utilize the word features for document creation
CO5[K4]	analyze the commands for simple visual presentations

PART V	
Course Code: BDSA2	**Course Title: SOCIAL AWARENESS PROGRAMMES & PHYSICAL EDUCATION**
On successful completion of the course, the learners should be able to	
CO1[K3]	identify their interest, leadership skills and undertake challenges.
CO2[K3]	adapt to work in team and communicate effectively with the society
CO3[K3]	instill a sense of responsibility on environmental issues and conservation of nature
CO4[K6]	develop the habit of creating awareness on health for society
CO5[K6]	build up a positive image of women with self-confidence and self-awareness.

பொதுத்தமிழ்	
Course Code: BDGT31	**Course Title: சமய இலக்கியமும் நாடகமும்**
இப்பாடத்தை முழுமையாகக் கற்றபின் மாணவியர் பெறும் திறன்கள் :	
CO1[K2]	சமய இலக்கியங்கள் மற்றும் நாடகங்கள் புலப்படுத்தும் கருத்துக்களையும் செய்யுள் யாப்பு மரபுகளையும் எடுத்துரைப்பர்.
CO2[K3]	இறையடியார்கள் இறைவனைப் போற்றும் மரபினை அடையாளப்படுத்துவர்.
CO3[K4]	அடியவர்கள் இறைவனை வேண்டும் மரபினையும் அவர்களது இலக்கியங்களில் இடம்பெற்றுள்ள புராணக் கருத்துக்களையும் ஆய்ந்தறிவர்.
CO4[K4]	சமய இலக்கியங்கள் உணர்த்தும் இறை மற்றும் தத்துவச் சிந்தனைகளை ஆராய்வர்.
CO5[K5]	சமய இலக்கியங்கள் மற்றும் நாடகங்களின் பொருண்மைகளை மதிப்பிடுவர்.

HINDI LANGUAGE COURSE	
Course Code: BDGH31	**Course Title: HINDI LANGUAGE COURSE- III**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and poetics
CO2[K2]	explain the renowned literary pieces and describe factual reports for everyday life
CO3[K3]	identify the techniques and writing style of writers
CO4[K4]	analyse the literary elements in the works of writers
CO5[K5]	appraise the works of writers

FRENCH LANGUAGE COURSE	
Course Code: BDGF31	**Course Title: FRENCH LANGUAGE COURSE- III**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French
CO2[K3]	explain the grammatical concept, express their feelings and opinions in French
CO3[K3]	use grammar in framing correct sentences
CO4[K4]	analyse the importance of French in day to day life
CO5[K5]	assess the usage of French grammar in everyday life

PART II– ENGLISH	
Course Code: BDGE31	**Course Title: ENGLISH FOR ENRICHMENT - I**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the content through the study of language and literature
CO2[K2]	comprehend and respond to passages, situations and texts
CO3[K3]	apply appropriate vocabulary and construct ideas
CO4[K4]	analyze the prescribed literary pieces
CO5[K5]	develop grammatical structures accurately and appraise literature

Core Course	
Course Code: BDMC31	**Course Title: MECHANICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts & principles of statics and dynamics.
CO2[K3]	apply the geometrical arguments for proving the results in Mechanics.
CO3[K3]	solve problems in Forces acting at a point, Moments, Friction, Projectiles and Collision using the laws and theorems.
CO4[K4]	analyze the mechanism of physical problems.
CO5[K5]	evaluate resultant of any number of forces acting on a particle in real life problems.

Core Course	
Course Code: BDMC32	**Course Title: DIFFERENTIAL EQUATIONS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of ODE, PDE and Laplace transforms.
CO2[K3]	apply the concepts of first order differential equation in solving real life problems.
CO3[K3]	solve the ODE and simultaneous linear differential equations by using Laplace transforms.
CO4[K4]	examine the different forms of ODE and PDE for finding the solutions.
CO5[K5]	evaluate problems of ODE and PDE.

Allied Course	
Course Code: BDMC3A	**Course Title: PROGRAMMING IN C & C++**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamentals of C and C++.
CO2[K3]	apply decision making, looping, branching statements, structure, union, constructor and destructor to create simple programs.
CO3[K3]	identify various dimensional arrays, string handling and user defined functions.
CO4[K4]	analyze the concept of various types of operator overloading and inheritance.
CO5[K5]	choose appropriate OOPs concept for solving real life problems.

Allied Course	
Course Code: BDMC3AL	**Course Title: PROGRAMMING IN C & C++ LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain conditional, control making statements and OOPs for solving problems.
CO2[K3]	develop programming skills.
CO3[K4]	analyze the concepts of functions, structures, constructor and overloading.
CO4[K5]	deduct and rectify errors in programs.
CO5[K6]	create programs for real life situation.

பொதுத்தமிழ்		
Course Code: BDGT41		**Course Title: கவிதை இலக்கியமும் சிறுகதையும**
இப்பாடத்தை முழுமையாகக் கற்றபின் மாணவியர் பெறும் திறன்கள்		
CO1[K2]	இலக்கியங்களின் உட்பொருளினை எடுத்துரைப்பர்.	
CO2[K3]	இலக்கிய வரலாறு, அணிவகைகளின் இலக்கணத்தையும், கலைச்சொற்களின் பொருளையும் அடையாளப்படுத்துவர்.	
CO3[K3]	இலக்கியப் படைப்புகளில் பதிவாகியுள்ள சமூகச் சிந்தனைகளைக் கட்டமைப்பர்.	
CO4[K4]	இலக்கியங்கள் புலப்படுத்தும் மனிதநேயக் கருத்துக்களை ஆராய்வர்	
CO5[K5]	இலக்கியப் படைப்புகளில் இடம்பெறும் மாந்தர்களின் பண்புநலன்களை மதிப்பிடுவர்.	

HINDI LANGUAGE COURSE	
Course Code: BDGH41	**Course Title: HINDI LANGUAGE COURSE- IV**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the significant contributions of the writers and the history of Hindi Literature
CO2[K2]	explain the renowned literary pieces
CO3[K3]	identify the techniques and writing style of writers and demonstrate the ability to write on given topics
CO4[K4]	analyse the literary elements in the works of writers
CO5[K5]	appraise the works of writers, practice the art of translation

FRENCH LANGUAGE COURSE	
Course Code: BDGF41	**Course Title: FRENCH LANGUAGE COURSE- IV**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic elements of grammar in French
CO2[K2]	explain the grammatical concept, express their feelings and opinions in French
CO3[K3]	use grammar in framing correct sentences
CO4[K4]	analyse the importance of French in day to day life
CO5[K5]	assess the usage of French grammar in everyday life

PART II– ENGLISH	
Course Code: BDGE41	**Course Title: ENGLISH FOR ENRICHMENT - II**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the content through the study of language and literature
CO2[K2]	comprehend and respond to passages, situations and texts
CO3[K3]	apply appropriate vocabulary and construct ideas
CO4[K4]	analyze the prescribed literary pieces
CO5[K5]	develop grammatical structures accurately and appraise literature

Core Course	
Course Code: BDMC41	**Course Title: GRAPH THEORY**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of graph theory.
CO2[K3]	apply logical argument / algorithm for proving characterization, equivalent conditions in graph theory.
CO3[K3]	solve the real-life problems using graph theoretical structures.
CO4[K4]	analyze the properties of vertex and edge colouring in graphs.
CO5[K5]	prove the properties of different types of graphs.

Core Course	
Course Code: BDMC42	**Course Title: SEQUENCES AND SERIES**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts sequences and series.
CO2[K3]	develop the properties of convergent, divergent and oscillating sequences.
CO3[K3]	apply logical argument for proving characterization, equivalence criterions on various concepts of sequences and series.
CO4[K4]	analyze the behaviour of series through various tests.
CO5[K5]	justify the nature of sequences.

Allied Course	
Course Code: BDMC4A	**Course Title: PROGRAMMING IN PYTHON**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the principles of Python.
CO2[K2]	describe data types, operators, functions tuples, dictionaries and files.
CO3[K3]	use loops, functions and data types to write simple programs.
CO4[K3]	write Python program using OOPs.
CO5[K4]	analyze the process of structuring the data using Lists, Tuples and Dictionaries.

Allied Course	
Course Code: BDMC4AL	**Course Title: PROGRAMMING IN PYTHON LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the structures and syntax of Python.
CO2[K3]	write programs using data types, tuples and dictionaries.
CO3[K4]	distinguish C and C++ with Python.
CO4[K5]	deduct and rectify the errors in programs.
CO5[K6]	develop their programming skills.

DISCIPLINE SPECIFIC COURSE	
Course Code: BDMC4DSL	**Course Title: MATHEMATICA LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the technical codings for efficient usage of Mathematica software.
CO2[K3]	apply the suitable syntax and semantics to solve real life problems.
CO3[K3]	develop programming skills.
CO4[K4]	analyze the concepts of algebra, graph theory and differential equations
CO5[K5]	evaluate problems on integrals.

Core Course	
Course Code: BDMC51	**Course Title: REAL ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain countability, basic concepts and the properties of metric spaces.
CO2[K3]	make use of continuous functions to prove results in context of real line.
CO3[K3]	identify the behaviour of complete metric space.
CO4[K4]	analyze the characteristics and equivalent criterions of various concepts of R.
CO5[K5]	prove theorems, results and corollaries on real line.

Core Course	
Course Code: BDMC52	**Course Title: MODERN ALGEBRA**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts in Groups and Rings.
CO2[K3]	apply the logical arguments for proving the characterizations/equivalent conditions of algebraic structure.
CO3[K3]	solve problems using the results of Groups and Rings
CO4[K4]	analyze the nature and properties of Rings and Ideals.
CO5[K5]	justify the statements in Groups / Rings.

Core Course	
Course Code: BDMC5L	**Course Title: MATLAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the codings of MATLAB.
CO2[K3]	find regression lines for any bivariate data.
CO3[K3]	apply MATLAB tools for solving Mathematical problems and drawing graphs.
CO4[K4]	analyze various differential equations and find the solution.
CO5[K5]	evaluate the optimal solution of LPP and value of integral.

Elective Course	
Course Code: BDMC5E1	**Course Title: LINEAR PROGRAMMING**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain LPP, canonical & standard form, primal-dual form and sub / special classes of LPP.
CO2[K3]	apply efficient computational techniques and algorithms that are needed to solve optimization problems.
CO3[K3]	solve the balanced / unbalanced problems in sub/special classes of LPP.
CO4[K4]	examine feasible, infeasible, IBFS, unbounded, degenerate/non degenerate solutions to a LPP, TP and AP.
CO5[K6]	construct mathematical formulation for real life problems.

Elective Course	
Course Code: BDMC5E2	**Course Title: FOURIER ANALYSIS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the expansion of periodic functions.
CO2[K3]	apply mathematical skill to construct Fourier series for any function.
CO3[K3]	develop the finite Fourier sine cosine transform.
CO4[K4]	analyze the applications of Fourier integrals formula.
CO5[K6]	construct the Fourier sine and cosine transform.

Elective Course	
Course Code: BDMC5E3	**Course Title: DISCRETE MATHEMATICS**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic principles of discrete Mathematical structures.
CO2[K3]	write the truth table for any logical statement.
CO3[K3]	identify the normal forms and quantifiers.
CO4[K4]	analyze the concept of Boolean algebra in switching circuits.
CO5[K5]	evaluate the types of Grammars and generate them for Languages.

Elective Course	
Course Code: BDMC5E4	**Course Title: MODERN APPLIED ALGEBRA**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain algebraic systems, Boolean algebra and lattice.
CO2[K3]	apply algebraic structures to data communication.
CO3[K3]	solve problems in modular and geometric lattices.
CO4[K4]	analyze the concepts of coding and decoding digital information.
CO5[K5]	evaluate problems on applied algebra.

Core Course	
Course Code: BDMC5V	**Course Title: INTERNSHIP/ON-THE JOB TRAINING**
On successful completion of the course, the learners should be able to	
CO1[K2]	relate the class room theory with work place practice.
CO2[K3]	apply the practices / procedures observed in real time working environment.
CO3[K4]	analyze the workflow and communication flow prevailing in the institution/industry.
CO4[K5]	assess interests and abilities in their field of study .
CO5[K6]	propose strategies, policies and guidelines for enhancing efficiency of industrial/institutional operations.

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SKILL BASED COURSES		
Course Code: BDCG51		**Course Title: CAREER GUIDANCE**
On successful completion of the course, the learners should be able to		
CO1[K1]	recall the basic concepts about history, culture of India and languages.	
CO2[K2]	summarize the various events related to Indian economy and Indian national movement.	
CO3[K2]	explain the multi - dimensional aspects of science.	
CO4[K3]	apply the mathematical knowledge to solve different problems.	
CO5[K5]	analyze the problems related to mental ability and reasoning power.	

Core Course		
Course Code: BDMC61		**Course Title: COMPLEX ANALYSIS**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the fundamental concepts of complex numbers.	
CO2[K3]	solve problems in context of complex numbers system.	
CO3[K3]	identify the behaviour of conformal mapping and transformations.	
CO4[K4]	analyze the characteristics and equivalence criterions of various concepts of complex numbers.	
CO5[K5]	prove theorems, corollaries and results of complex numbers.	

Core Course		
Course Code: BDMC62		**Course Title: LINEAR ALGEBRA**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the fundamental concepts of linear space and theory of matrix.	
CO2[K3]	develop the properties of inner Product Spaces and bilinear forms.	
CO3[K3]	solve problems in linear algebra and compute eigen values and eigen vectors.	
CO4[K4]	analyze the characteristics and equivalence criterions of linear space and matrix theory.	
CO5[K5]	prove theorems, results and corollaries on linear algebra.	

Core Course	
Course Code: BDMC6P	**Course Title: Project**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the concept in their area of specialization.
CO2[K3]	apply programming languages to solve real life problems.
CO3[K4]	analyze the strength and weakness of team work.
CO4[K5]	develop presentation skills and leadership qualities.
CO5[K6]	create new ideas in emerging trends of Mathematics.

Core Course	
Course Code: BDMC6L	**Course Title: MAPLE LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the technical codings for efficient usage of Maple software.
CO2[K3]	identify suitable tools to solve real life problems.
CO3[K3]	solve problems on matrices.
CO4[K5]	determine the values of trigonometric and algebraic functions.
CO5[K6]	create program for solving differential equations.

Elective Course	
Course Code: BDMC6E1	**Course Title: OPERATIONS RESEARCH**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the basic concepts of decision making and optimization problem.
CO2[K3]	write various types of queueing models.
CO3[K3]	apply quantitative technique to solve optimization problems.
CO4[K4]	examine problems on queueing theory and inventory control.
CO5[K5]	evaluate problems on sequencing and replacement of machines to make effective business decisions.

Elective Course		
Course Code: BDMC6E2		**Course Title: AUTOMATA AND FORMAL LANGUAGES**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the basic knowledge in automation and phrase structure grammars.	
CO2[K3]	construct derivation trees.	
CO3[K3]	apply the concepts in theoretical computer science.	
CO4[K4]	analyze regular languages.	
CO5[K5]	evaluate problems on automata and formal languages.	

Non Major Elective Course		
Course Code: BDMC4N		**Course Title: NUMERICAL APTITUDE I**
On successful completion of the course, the learners should be able to		
CO1[K2]	discuss the formulae to know the basics of quantitative aptitude.	
CO2[K2]	estimate problems on ratio and proportion & time and work.	
CO3[K3]	solve problems on permutations and combinations.	
CO4[K3]	develop skills to attend the competitive exams confidently**.**	
CO5[K4]	examine the problem solving skills on quantitative aptitude.	

Non Major Elective Course		
Course Code: BDMC5N		**Course Title: NUMERICAL APTITUDE II**
On successful completion of the course, the learners should be able to		
CO1[K2]	discuss the basic formulae in mathematics.	
CO2[K2]	summarize solutions for arithmetic problems.	
CO3[K3]	find problems in volume and surface area.	
CO4[K3]	solve the problem solving skills in arithmetic.	
CO5[K4]	analyze skills to attend the competitive exams confidently**.**	

Job Oriented Course		
Course Code: BDJO70		**Course Title: MATHEMATICAL STATISTICS**
On successful completion of the course, the learners should be able to		
CO1[K2]	explain the basic concepts of statistics.	
CO2[K3]	estimate a line of best fit.	
CO3[K3]	apply statistical techniques to solve real life problems.	
CO4[K4]	analyze various statistical parameters.	
CO5[K5]	evaluate correlation coefficient and form regression lines for any bivariate data.	

Job Oriented Course	
Course Code: BDJO70L	**Course Title: - MATHEMATICAL STATISTICS LAB**
On successful completion of the course, the learners should be able to	
CO1[K2]	explain the fundamentals of SPSS package.
CO2[K3]	apply SPSS packages to find solutions for various statistical parameters.
CO3[K3]	analyze the bivariate data and form regression lines.
CO4[K4]	compare various types of charts.
CO5[K5]	evaluate problems in various disciplines.