

MASTER OF MATHEMATICS

COURSE OUTCOMES

SEMESTER I

ALGEBRA	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	gain deep knowledge about various algebraic structures.	K₁
CO2	understand the concepts from simple groups to extension field.	K₂
CO3	apply the algebraic methods for solving problems.	K₃
CO4	recognize some advanced results of the theory of groups, rings & fields.	K₄
CO5	state and prove the various algebraic structures.	K₅

REAL ANALYSIS	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	define and recognize the series of real numbers and convergence and define the basic terms under uniform convergence, linear transformation, Lebesgue measure and Lebesgue integral	K₁ & K₂
CO2	analyze and apply the concepts of convergence criteria, linear transformation, Lebesgue measure and Lebesgue integral	K₄ & K₃
CO3	prove the theorems in Riemann Stieltjes integral, Uniform convergence, Linear transformation, Lebesgue measure and Lebesgue integral	K₃ & K₅

ORDINARY DIFFEENTIAL EQUATIONS	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	define ordinary point, Legendre equation, Bessel equation, Fundamental matrix, Picard's theorem and oscillations of solutions.	K₁
CO2	understand the existence ,uniqueness of solutions of systems of linear differential equations & Non-linear initial value problems.	K₂
CO3	identify the results in systems of linear differential equations & Non- linear initial value problems.	K₃
CO4	examine the solutions of systems of linear differential equations and Non- linear initial value problems . Analyze the oscillations of solutions of second order differential equations.	K₄
CO5	apply power series method and successive approximation method to evaluate the solutions of systems of linear differential equations and Non-linear initial value problems.	K₅

NUMERICAL METHODS	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the concept of numerical differentiation, integration, solution of system of both ordinary and partial differential equations and the difference between the boundary value and characteristic value problems.	K₂ & K₄
CO2	remember the formulae for central difference formulae, numerical differentiation, integration and also write the formulae for various methods.	K₁
CO3	identify the numerical results of both ordinary and partial differential equations by using various methods.	K₃
CO4	learn how to solve the problems numerically by using direct, indirect methods, single step and multistep methods and also the problems based on non linear equations.	K₂ & K₅

LATEX	CATEGORY	L	P	CREDIT
	ELECTIVE	48	-	2

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	learn the history of LaTeX and understand the basics of a LaTeX .	K₁ & K₂
CO2	apply LaTeX concepts in creating tables and drawing pictures.	K₃
CO3	analyze the concepts of LaTeX to write programs.	K₄
CO4	determine the LaTeX commands .	K₅

CRYPTOGRAPHY	CATEGORY	L	P	CREDIT
	ELECTIVE	72	-	4

Course Outcomes

On the successful completion of the course students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the fundamentals of cryptography.	K₁& K₂
CO2	apply the basic concepts and algorithm of number theory to understand the design of DES and other cryptographic algorithms.	K₃&K₂
CO3	design security application in the field of information technology.	K₅
CO4	analyze the security issues in the network and resolve it.	K₃&K₅
CO5	Gain the knowledge about public key cryptography	K₁

SEMESTER II

COMPLEX ANALYSIS	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	define analytic function, complex integration, Residues , Taylor Series , Laurent Series and mappings.	K₁ & K₂
CO2	apply Cauchy's theorem , Taylor's Theorem , Residue Theorem , Weierstrass Theorem, Riemann Mapping Theorem for the analytic function.	K₃
CO3	analyze singularities and power series expansion.	K₄
CO4	evaluate integrals along a path in the complex plane, branch points.	K₅

PARTIAL DIFFERENTIAL EQUATIONS	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	gain the knowledge in hyperbolic, parabolic, elliptic type partial differential equations, method of separation of variables, initial and boundary value problems, Green's function.	K₁
CO2	understand the classification of second order partial differential equations, D'Alembert's solution, existence and uniqueness of solutions, method of images.	K₂
CO3	apply the methods of separation of variables and methods of green's function to evaluate initial and boundary value problems.	K₃
CO4	classify second order partial differential equations and analyze the solutions of initial and boundary value problems.	K₄
CO5	construct the solutions of second order partial differential equations.	K₅

MECHANICS	CATEGORY	L	P	CREDIT
	CORE	72	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the notions of configuration space, generalised coordinates, canonical transformations and phase space in mechanics.	K₁ & K₂
CO2	analyze the Euler-Lagrange equations from a variational principle and Hamiltonian formulation of a mechanical system	K₄
CO3	apply theoretical techniques including variational principles & Hamilton Jacobi Theory and also to apply these techniques to analyze elementary mechanical systems.	K₃ & K₄
CO4	evaluate the cause of linear, rotational and rolling motions, by describing torques, work and energy, impulse and momentum associated with objects undergoing each type of motion.	K₅

CORE IX: OPTIMIZATION TECHNIQUES

OPTIMIZATION TECHNIQUES	CATEGORY	L	P	CREDIT
	CORE	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the mathematical tools that are needed to solve optimization problems.	K ₂
CO2	➤ learn how to solve the transportation problems by using various techniques and to find the shortest path for Network scheduling. ➤ introduce the use of basic methodology for the solution of linear programs and integer programs. ➤ introduce the advanced methods for large-scale transportation and assignment problems.	K ₃ , K ₄ & K ₅
CO3	define the basic terms under transportation problems, Network scheduling and probability.	K ₁

DIFFERENTIAL GEOMETRY	CATEGORY	L	P	CREDIT
	ELECTIVE	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	evaluate problems by using the different types in binomial series.	K₅
CO2	gain the knowledge about the concept of sequence and series.	K₁ & K₂
CO3	identify the process of convergence and divergence through different types of test.	K₄
CO4	learn how to use reciprocals and transformations to solve equations.	K₂
CO5	evaluate the problems by using Newton's and Horner's method.	K₅

NEURAL NETWORKS	CATEGORY	L	P	CREDIT
	ELECTIVE	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	analyze the difference between Hamming Network and Hopfield Network.	K₄
CO2	gain the knowledge about the concept of Quadratic functions and conjugate gradient.	K₁ & K₂
CO3	apply Taylor series to solve different types of problems.	K₃
CO4	learn the concepts of Multilayer Perceptrons.	K₂
CO5	evaluate the problems by using Back propagation Algorithm .	K₅

CYBER SECURITY	CATEGORY	L	P	CREDIT
	SKILL ENHANCEMENT COURSE	24	-	2

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	understand the basic concepts of information security and its types	K₁
CO2	obtaining the knowledge thoroughly on cyber security and its principles	K₁
CO3	deals with risk management and threats	K₁ & K₂
CO4	gain detailed knowledge on security issues in social media	K₃ & K₄
CO5	apply and work with cyber security applications in real world	K₅ & K₆

SEMESTER III

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE	17MAP15	TOPOLOGY	84	-	5

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the axioms of topological space, connected space, countability, separation, completely regular space, complete metric space.	K ₁
CO2	Define and recognize the properties of general topological space, continuous function, metric space, compactness.	K ₁ & K ₂
CO3	Apply the concepts of Urysohn lemma, Urysohn metrization theorem, the Tychonoff theorem and Ascoli's theorem in topological spaces.	K ₃
CO4	Analyze the separation properties, convergent sequence, metric space in the general theory of topological space	K ₄
CO5	prove the theorems in Topological space, connectedness and compactness, countability and separation axioms, completely regular space and complete metric.	K ₃ & K ₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE	17MAP16	THEORY OF NUMBERS	72	-	5

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	gain the knowledge in theory of numbers	K₁
CO2	understand the concepts of Congruences, Quadratic reciprocity and Arithmetic functions.	K₂
CO3	analyze and solve the problems by using Congruence formula	K₄ & K₅
CO4	apply Quadratic reciprocity law to solve the problems	K₃ & K₅
CO5	evaluate the solutions of congruences of higher degree	K₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE	17MAP15	MATHEMATICAL STATISTICS	84	-	5

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	define the concepts based on probability.	K₁
CO2	analyze the various kinds of distribution functions.	K₄
CO3	gain the knowledge about the different types of density functions.	K₂
CO4	apply the concepts based of moment – generating functions to find the moments.	K₃
CO5	evaluate the problems based on Uniform, Bernoulli, Binomial, Uniform, Exponential and Chi-Square Distributions.	K₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
PROFICIENCY ENHANCEMENT (SELF STUDY)	17PEP01	INDUSTRIAL MATHEMATICS	-	-	2

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the meaning, purpose, and tools of operations research.	K₂
CO2	gain the knowledge about simulation, Inventory control and Numerical Methods.	K₁
CO3	apply the concepts of Inventories to find EOQ.	K₃
CO4	Analyze the concept of Interpolation with equal and unequal integrals and find the solution to the problems by using various methods.	K₂ & K₄
CO5	evaluate the problems based on types of inventory control.	K₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
ELECTIVE	17MAP20A	GRAPH THEORY	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the basic concepts of graph theory.	K₁
CO2	gain the knowledge about graph and types of graph.	K₂
CO3	apply the concepts in Euler tours and Hamiltonian cycles.	K₃
CO4	analyze the Matching and Independent sets.	K₃& K₄
CO5	Evaluate the Colouring.	K₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
ELECTIVE	17MAP20B	PROGRAMMING IN C++	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	use the basic object-oriented design principles in computer problem solving and understand the basic concepts of oop, functions in C++, C++ streams, specifications about the class, Defining operator overloading, types of inheritances.	K ₁ & K ₅
CO2	learn the characteristics of an object-oriented programming language: data abstraction and information hiding, inheritance, and dynamic binding of the messages to the methods.	K ₂ & K ₄
CO3	learn how to design and implement generic classes with C++ templates.	K ₄
CO4	apply overloading of operators in C++ .	K ₃
CO5	write the programs by using the concepts of C++	K ₅

SEMESTER IV

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE	17MAP22	FUNCTIONAL ANALYSIS	72	-	5

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the basic concept of Banach spaces, Continuous linear functional, Bounded linear operator, Hilbert spaces and operators.	K ₁
CO2	define Banach space, Hilbert space and the conjugate of an operator.	K ₁ & K ₂
CO3	apply the knowledge of functional analysis to solve mathematical problems.	K ₃ & K ₅
CO4	analyze some basic properties by using metric spaces, normed linear space, parallelogram law, orthogonal complements, the adjoint operators, projection theorem.	K ₄
CO5	establish the weak and weak* topology, complete orthogonal set, complete orthonormal set adjoint operators and projection operators.	K ₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE	17MAP23	MATHEMATICAL METHODS	84	-	6

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	define the concepts based on Fourier Sine and Cosine transforms, Hankel transforms, Various types of integral equations and Calculus of Variations.	K₁
CO2	analyze and apply the Fourier Transforms in Laplace Equation and also apply the integral equations in ordinary differential equations..	K₄ & K₃
CO3	gain the knowledge about the properties of Fourier and Hankel Transforms.	K₂
CO4	learn and analyze the concepts of Fredholm Integral Equation and Volterra Integral equation, Calculus of Variation.	K₂ & K₄
CO5	evaluate the problems based on Fourier Cosine and sine Transforms, Axisymmetric Dirichlet problems, Euler's Equation and Fredholm Integral Equation and Volterra Integral equations.	K₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE	17MAP24	FLUID DYNAMICS	72	-	5

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	define the concepts based on compressible and incompressible flow, stream lines ,path lines, velocity, density and pressure, source and sink, vortex.	K ₁
CO2	analyze and apply the concepts of fluid dynamics in momentum theorem, Blasius theorem and Navier Stokes equations.	K ₄ & K ₃
CO3	gain the knowledge about vorticity and circulation in various fluid, conservative forces and boundary layer equations.	K ₂
CO4	learn and analyze the concepts based on displacement thickness, momentum thickness and kinetic energy thickness.	K ₂ & K ₄
CO5	evaluate the problems based on stream lines, path lines in two – dimensional motion.	K ₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
ELECTIVE	17MAP28A	FUZZY LOGIC AND FUZZY SETS	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	gain the knowledge about fundamentals of fuzzy set theory with fuzzy logic.	K₁ & K₂
CO2	apply the concepts of fuzzy sets in fuzzy relations.	K₃
CO3	analyze the fuzzy measures.	K₃
CO4	evaluate the fuzzy logic in various types of uncertainty	K₄
CO5	evaluate their relation to information and complexity.	K₅

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
ELECTIVE	17MAP28B	CONTROL THEORY	60	-	4

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	understand the mathematical tools that are needed to solve differential equations.	K₂
CO2	gain the knowledge about research methodology.	K₁
CO3	identify the differential equation models to the real system.	K₄
CO4	learn how to use the various techniques of control systems.	K₂ & K₃
CO5	evaluate the different types of equations to solve real life problems.	K₅

SYLLABUS FOR CORE OPTIONAL COURSE OFFERED BY DEPARTMENT OF MATHEMATICS

COURSE OUTCOMES FOR OPTIONAL COURSES

CATEGORY	COURSE CODE	TITLE OF THE COURSE	C	P	CREDIT
CORE OPTIONAL	***	STATISTICAL METHODS	36	-	3

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	gain knowledge about measures of central tendency, correlation and regression ,time Series and probability.	K₁ & K₂
CO2	apply statistical methods for estimating trend on time series, measures of central tendency.	K₃
CO3	analyze the concept of probability under addition and multiplication theorems and apply the same.	K₄
CO4	analyze the method of correlation and regression.	K₄
CO5	evaluate the simple problems based on measures of central tendency, correlation and regression, probability addition and multiplication theorems.	K₅

SYLLABUS FOR ALLIED COURSES

P.K.R ARTS COLLEGE FOR WOMEN

(Accredited with 'A' Grade by NAAC)

An Autonomous Institution-Affiliated to Bharathiar University

MCA DEGREE PROGRAMME

I SEMESTER

OPERATIONS RESEARCH	CATEGORY	L	P	CREDIT
	ALLIED	48	-	3

Course Outcomes

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand the concepts of formulation of an L.P.P, Construction of network, Costs involved in inventory	K₁ & K₂
CO2	Analyze various methods to solve L.P.P	K₃ & K₅
CO3	Learn and Apply algorithms to solve L.P.P	K₂ & K₃
CO4	Evaluate the network scheduling, EOQ problem, Linear programming problem	K₅
CO5	Analyze Replacement policy and to evaluate Replacement problem.	K₃ & K₅