J.J. College of Arts & Science (Autonomous), Pudukkottai

Department of Mathematics

Course Outcomes

M.Sc. Mathematics – PSMT

Course Name - Algebra- I		Course Code - P1R1MTCC1
Upon Completion of the course students would be able to		
CO 1	Acquire knowledge on the metric spaces.	
CO 2	Apply the mean value theorems in a correct mathematical way.	
CO 3	Study Cauchy sequence, upper and lower limits of number sequence.	
CO 4	Learn series, power series, absolute convergence and rearrangements.	
CO 5	Understand continuity, compactness and monotonic functions.	
Course Name - Real Analysis- I		**Course Code - P1R1MTCC2**
Upon Completion of the course students would be able to		
CO 1	Acquire knowledge on the metric spaces.	
CO 2	Apply the Mean value theorems in a correct Mathematical way.	
CO 3	Study Cauchy's sequence,upper and lower limits of numerical sequences.	
CO 4	Learn series, power series Absolute convergence and rearrangement.	
CO 5	Understand continuity compactness and monotonic functions.	
Course Name – Ordinary Differential Equations		**Course Code – P1R1MTCC3**
Upon Completion of the course students would be able to		
CO 1	Use the method of variation of parameters to find particular solutions of second order, linear homogeneous equations.	
CO 2	Use the method of undetermined co-efficient to solve 2^{nd} order linear homogeneous equations.	
CO 3	Learn about Legendre Polynomials, Bessels function and Gamma functions	
CO 4	Acquire the knowledge of apply the Laplace transform to solve the simultaneous linear equations.	
CO 5	Use the method of successive approximation Picards theorem.	

Course Name - Classical Mechanics		Course Code – P1R1MTCC4
Upon Completion of the course students would be able to		
CO 1	Have a deep understanding of Mechanics of a system of practical and D'Alembert's principle.	
CO 2	Be able to solve the DE for the orbit.	
CO 3	Be familiar with Kepler's problem used in physics.	
CO 4	Know about Euler's Equation on the notation of rigid body.	
CO 5	Study about Routh procedure to derive Hamiltons Equations.	
Course Name - Algebra – II		Course Code – P2R1MTCC5
Upon Completion of the course students would be able to		
CO 1	Have a deep understanding of vector spaces.	
CO 2	Understand the concept of Extension field, Splitting field and Root field.	
CO 3	Explain the notion of Galois Theory.	
CO 4	Describe the structure of modules.	
CO 5	Apply the concept of the Decomposition and Nilpotent transformations.	
Course Name – Real Analysis - Ii		Course Code – P2R1MTCC6
Upon Completion of the course students would be able to		
CO 1	Study in detail the Mean value theorem and Taylor's theorem.	
CO 2	Acquire knowledge on Differentiations and Integrations.	
CO 3	Learn Cauchy's sequences, Limit superior and Limit inferior.	
CO 4	Understand the concepts of power series –Fourier series.	
CO 5	Study inverse function theorem and implicit function theorem.	

Course Name - Partial Differential Equations		Course Code – P2R1MTCC7
Upon Completion of the course students would be able to		
CO 1	Able to solve first order linear differential equations using Charpit's method & Jacobi's Method	
CO 2	Understand the quasi linear equations and non linear first order PDE.	
CO 3	Acquire knowledge to solve second order PDE.	
CO 4	Understand the Laplace transform to compute solutions of equations involving impulse functions.	
CO 5	Learn about Duhamel's principle and wave and heat conduction equation.	
Course Name - Topology		Course Code – P2R1MTCC8
Upon Completion of the course students would be able to		
CO 1	Obtain the knowledge of fundamental concepts and methods in General topology.	
CO 2	Acquire knowledge about Product topology and Metric topology .	
CO 3	Know about connectedness and intermediate theorem.	
CO 4	Study about compactness-extreme value theorem and uniform continuity theorem.	
CO 5	Learn about normal spaces and Tietz extension theorem.	
Course Name – Fluid Dynamics		Course Code – P3R1MTCC9
Upon Completion of the course students would be able to		
CO 1	Recognize the principles written in form of mathematical equations in fluid dynamics.	
CO 2	Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics using potential theorems.	
CO 3	Understand Stoke's stream function.	
CO 4	Study Milne-Thomson circle theorem and theorem of Blasius.	
CO 5	Acquire knowledge of steady of viscous flows.	

Course Name - Functional Analysis	Course Code – P3R1MTCC10
Upon Completion of the course students would be able to	
CO 1	Understand the concept of Banach spaces & Hilbert spaces.
CO 2	Acquire knowledge about Hilbert spaces.
CO 3	Describe the structure of finite dimensional spectral theory.
CO 4	Study about Regular, singular elements and the spectrum.
CO 5	Learn about Fixed point theorem, Picard's theorem and Stone's theorem.
Course Name - Complex Analysis	Course Code – P3R1MTCC11
Upon Completion of the course students would be able to	
CO 1	Recognize the concept of Analytical function.
CO 2	Study Cauchy's theorem for a rectangle in a disk.
CO 3	Use Taylor's theorem and the maximum principle.
CO 4	Have a deep understanding of Residues to evaluate definite integrals.
CO 5	Know about Schwarz's theorem and reflection principle.
Course Name - Measure Theoryand Integration	Course Code – P3R1MTCC12
Upon Completion of the course students would be able to	
CO 1	Understand basis of measure theory
CO 2	Study about Riemann and Lebesgue integrals.
CO 3	Acquire the knowledge of convergence in measure.
CO 4	Understand the Hahn decomposition theorem & Jordan decomposition theorem.
CO 5	Learn about measurability and Fubini's theorem.

Course Name - Stochastic Processes		Course Code - P4R1MTCC13
Upon Completion of the course students would be able to		
CO 1	Acquire the knowledge of stochastic process, transition probabilities.	
CO 2	Understand transient and persistent state, stability of a Markov system.	
CO 3	Be familiar with Poisson process – Birth and death process.	
CO 4	Know about renewal process and renewal theorem.	
CO 5	Study about Queuing system – M/M/1: steady state behavior.	
Course Name - Optimization Techniques		Course Code - P4R1MTCC14
Upon Completion of the course students would be able to		
CO 1	Understand the different methods of I.P.P method and mixed integer LPP.	
CO 2	Acquire knowledge about Dynamic programming.	
CO 3	Study about Kuhn Tucker conditions and Quadratic programming.	
CO 4	Understand the concepts of Queuing system – Poisson Queuing system.	
CO 5	Discuss simulation method and select the suitable technique and the problem.	
Course Name - Calculus of Variations and Integral Equations		Course Code - P1R1MTEC1
Upon Completion of the course students would be able to		
CO 1	Acquire the knowledge of natural boundary conditions and transition condition.	
CO 2	Understand and apply the application of calculus of variations, using Hamilton's principle.	
CO 3	Know about the applications of Green's function to solve the integral equations.	
CO 4	Study Fredholm equations with separable kernels.	
CO 5	Apply iterative methods for solving equations of the second kind, using Fredholm theory.	

Course Name - Advanced Number Theory	Course Code - P1R1MTEC1
Upon Completion of the course students would be able to	
CO 1	Study the Mobius Inversion formula.
CO 2	Acquire the knowledge of phi – function.
CO 3	Learn about primitive roots and indices.
CO 4	Acquire the knowledge of number of special form.
CO 5	Demonstrate an in – depth understanding of Fibonacci sequences and SrinivasaRamanujan finite continued fractions.
Course Name - Fuzzy Mathematics and its Application	Course Code - P1R1MTEC1
Upon Completion of the course students would be able to	
CO 1	Discuss the types of operations on fuzzy sets, t- norms and fuzzy arithmetic.
CO 2	Study knowledge of fuzzy equivalence relations.
CO 3	Identify fuzzy relations, binary fuzzy relations and fuzzy equivalence relations.
CO 4	Gain the knowledge of constructing fuzzy sets and operations on fuzzy sets.
CO 5	Apply the fuzzy models to natural science and technical fields.
Course Name - Numerical Analysis	Course Code - P2R1MTEC2
Upon Completion of the course students would be able to	
CO 1	Understand the fundamentals of solutions of Algebraic and transcendental equations.
CO 2	Understand how to use Householder's method, power method.
CO 3	Acquire knowledge to use Hermite interpolation and least square approximation.
CO 4	B familiar with interpolation and extrapolation method.
CO 5	Use shooting method, to solve initial value problem.

Course Name - Automata Theory	Course Code - P2R1MTEC2
Upon Completion of the course students would be able to	
CO 1	Apply Automata concepts and techniques in designing systems that address real world problems.
CO 2	Understand the connection between language and computation.
CO 3	Analyze the computational strengths and weakness of these machines.
CO 4	Demonstrate an in-depth understanding of theories, concepts and techniques in automata and their link to computation.
CO 5	The conversion of regular expression to finite automata – scanning.
Course Name - Combinatorial Mathematics	Course Code - P2R1MTEC2
Upon Completion of the course students would be able to	
CO 1	Understand the ideas of Combinatorics.
CO 2	Study Ramsey numbers and strilling numbers.
CO 3	Study about pigeonhole principle.
CO 4	Acquire the knowledge generating function and counting technique.
CO 5	Use recurrence relations to solve problems of first, second and higher order linear homogeneous relations.
Course Name - Applied Mathematical Statistics	Course Code - P3R1MTEC3
Upon Completion of the course students would be able to	
CO 1	Acquire the knowledge of multiple and partial correlation.
CO 2	Acquire knowledge on Theory of Estimation and methods of estimating a parameter through sampling and test their Goodness.
CO 3	Study the advantages and drawbacks of Non – parametric method and test for randomness.
CO 4	Know about analysis of one way and two way classifications.
CO 5	Understand the concept of Factorial experiment – 2^2, 2^3, 2^n.
Course Name - Advanced Graph Theory	Course Code - P3R1MTEC3
Upon Completion of the course students would be able to	

CO 1	**Understand matching and coverings**
CO 2	**Acquire the knowledge of edge coloring and Ramsey's Theorem.**
CO 3	**Know about chromatic number and chromatic polynomials**
CO 4	**Characterize planar graphs and solve problems related to trees.**
CO 5	**Have a deep knowledge of Dominating and its applications.**
Course Name - Integrals of Special Functions	**Course Code - P3R1MTEC3**
Upon Completion of the course students would be able to	
CO 1	**Be familiar with Hermite polynomials and Hermite differential equations**
CO 2	**Study about Laguerre polynomials and Chebyshev polynomials**
CO 3	**Acquire knowledge of Rodrigues formula – Recurrence relations and Properties of Tchbycheff polynomials**
C O 4	**Have adeep knowledge of Elliptic Functions and Jacobian elliptic functions**
CO 5	**Know about orthogonality with respect to Weight functionand Storm-Liovillle's problem**
Course Name - Advanced Matlab	**Course Code - P4R1MTEC4**
Upon Completion of the course students would be able to	
CO 1	**Express programming and simulation for engineering problems.**
CO 2	**Find importance of this software for lab experimentation.**
CO 3	**Perform and evaluate the relational and logical operations.**
CO 4	**Solve optimization problems.**
CO 5	**Build a custom tool to draw various types of plots.**
Course Name - Graph Algorithms	**Course Code - P4R1MTEC4**
Upon Completion of the course students would be able to	
CO 1	**Understand some applications of graph theory to practical problems and other branches of Mathematics.**
CO 2	**Learn about how graph theory and combinatorics developed via a creative organic historical process.**
CO 3	**Use Kruskal's algorithm to form a spanning tree and a minimum cost spanning tree.**

CO 4	**Explain the Hamiltonian graphs algorithm and their analyses.**
CO 5	**Analyze the Hungarian algorithm.**