



## FATIMA COLLEGE (AUTONOMOUS), MADURAI-625018

### COURSE OUTCOMES

NAME OF THE PROGRAMME: B.Sc MATHEMATICS / B.Sc MATHEMATICS(SF)

PROGRAMME CODE: UAMA / USMA

COURSECODE	COURSETITLE	COURSEOUTCOMES
19M1CC1/19G1CC1	Calculus	<p>CO1: Explain higher derivatives and apply Leibnitz theorem to find the <math>n^{\text{th}}</math> derivative of functions.</p> <p>CO2: Solve problems on curvature, envelopes, asymptotes and Curve tracing.</p> <p>CO3: Construct reduction formula for trigonometric functions.</p> <p>CO4: Define Jacobian, double &amp; triple integrals and apply the knowledge of change of variables to solve the problems in double and triple integrals.</p> <p>CO5: Construct Fourier series by recalling integration.</p>

19M1CC2/ 19G1CC2	Classical Algebra	<p>CO1: Explain sets, relations and functions</p> <p>CO2: Define binomial series, logarithmic and exponential series and solve problems.</p> <p>CO3: Identify Relations between the roots and coefficients of equations.</p> <p>CO4: Explain the transformations of equations.</p> <p>CO5: Recognize the important Methods in finding roots.</p>
19M1AC1/ 19G1AC1	Statistics	<p>CO1: Solve problems on moments, skewness, kurtosis and correlation.</p> <p>CO2: Construct regression line and curve equation.</p> <p>CO3: Explain random variables and probability density function</p> <p>CO4: Solve problems on expectation.</p> <p>CO5: Define and explain analysis of time series and index numbers</p>

19P1ACM1	Allied Mathematics	<p>CO1: Find summation of any series.</p> <p>CO2: Explain the concepts of theory of equations.</p> <p>CO3: Calculate roots of equations using different methods.</p> <p>CO4: Expand trigonometric functions</p> <p>CO5: Apply the Leibnitz's theorem to find the <math>n^{\text{th}}</math> derivative</p>
19M1NME / 19M2NME/ 19G1NME/ 19G2NME	Quantitative Aptitude	<p>CO1: Solve problems on ages.</p> <p>CO2: Illustrate profit and loss with examples.</p> <p>CO3: Explain partnership and related problems.</p> <p>CO4: Discuss problems on time and work.</p> <p>CO5: Solve problems on time and distance.</p>
19M2CC3/ 19G2CC3	Differential Equations	<p>CO1: Solve problems in differential equations of first order</p> <p>CO2: Classify homogeneous and Non homogeneous differential equations of second order and solve problems.</p> <p>CO3: Solve differential equation problems using Laplace transform.</p> <p>CO4: Define Partial differential equations and solve problems.</p> <p>CO5: Solve problems on Growth, decay and chemical reactions.</p>

19M2CC4/19G2CC4	Numerical Methods	<p>CO1: Solve algebraic and transcendental equations using various methods.</p> <p>CO2: Identify the various methods of solving simultaneous linear algebraic equations.</p> <p>CO3: Recognize difference operators and apply the concept of interpolation.</p> <p>CO4: Compute the values of the derivatives at some point using numerical differentiation and integration.</p> <p>CO5: Solve problems on higher order differential equations using Euler's, Runge- kutta and Predictor- Corrector methods</p>
19M2AC2 / 19G2AC2	Advanced Statistics	<p>CO1: Classify discrete and continuous random variables and characteristics of Binomial distribution and Poisson distribution</p> <p>CO2: Explain and illustrate the properties of Normal distribution and solve variety of problems.</p> <p>CO3: Distinguish between a population and a sample and explain testing of hypothesis.</p> <p>CO4: Explain chi square distribution, t- distribution and describe their various applications in Statistics.</p> <p>CO5: Define F- distribution and apply it to solve problems in analysis of variance.</p>

19P2ACM2	Allied Mathematics-II	<p>CO1: Solve linear differential equations.</p> <p>CO2: Solve second order linear differential equations with variable coefficient.</p> <p>CO3: Define Laplace transform and apply it to solve differential equation.</p> <p>CO4: Explain the concepts of gradient, divergence, curl and their properties</p> <p>CO5: Apply line, volume and surface integrals to verify the Gauss divergence and Stoke's theorem.</p>
19M3CC5 / 19G3CC5	MODERN ALGEBRA	<p>CO1: Classify groups and explain their properties.</p> <p>CO2: Describe cosets and Lagrange's theorem.</p> <p>CO3: Explain the characteristics of different types of rings and their properties.</p> <p>CO4: Classify various types of ideals.</p> <p>CO5: Construct polynomial rings over UFD.</p>

19M3CC6/ 19G3CC6	VECTOR CALCULUS AND FOURIER TRANSFORM	CO1: Explain the concept of differentiation of vectors. CO2: Compute divergence and curl of vectors CO3: Solve problems on line and surface integrals. CO4: Compute Fourier sine and cosine transforms. CO5: Describe the properties of Fourier transforms.
19M3SB1 / 19G3SB1	APPLICATIONS OF CALCULUS AND DIFFERENTIAL EQUATIONS	CO1: Explain Beta and Gamma functions and their properties. CO2: Solve the problems in Maxima minima of functions of two variables. CO3: Describe trajectories and orthogonal trajectories. CO4: Solve Brachistochrone problems. CO5. Discuss dynamical problems with variable mass.
19C3ACM1	ALLIED MATHEMATICS -I	CO1: Appraise rank of a matrix, Eigen value and Eigen vectors. CO2: Obtain higher derivatives of functions. CO3: Solve exact and higher order differential equations. CO4: Expand trigonometric functions. CO5: Define Moments, kurtosis and to apply the same.

19B3ACM1	LINEAR PROGRAMMING	<p>CO1: Define basic concepts of Linear Programming problems.</p> <p>CO2: Apply various simplex methods to solve linear programming problems.</p> <p>CO3: Construct dual problem and solve the primal problem.</p> <p>CO4: Solve transportation problems.</p> <p>CO5: Distinguish assignment problem and travelling salesman problem.</p>
19M4CC7/ 19G4CC7	SEQUENCES AND SERIES	<p>CO1: Define basic concepts of sequences.</p> <p>CO2: Explain subsequences and Cauchy sequences.</p> <p>CO3: Differentiate various convergence test for series and use them to solve problems.</p> <p>CO4: Recognize alternating, convergent, conditionally and absolutely convergent series.</p> <p>CO5: Distinguish the behaviour of series and power series.</p>
19M4CC8 / 19G4CC8	LINEAR ALGEBRA	<p>CO1: Define Vector Space and explain its various concepts.</p> <p>CO2: Illustrate Inner Product Spaces.</p> <p>CO3. Define basic concepts of matrices and solve linear equations.</p> <p>CO 4. Appraise Eigen Value and Eigen Vectors of matrices.</p> <p>CO 5. Describe bilinear forms and quadratic forms.</p>

19M4SB2/ 19G4SB2	FOUNDATIONS OF MATHEMATICS	CO1: Recall some expansions of Trigonometric functions. CO 2: Explain Logarithms of Complex quantities. CO 3: Describe properties of integers. CO 4: Solve puzzles using Chinese remainder Theorem. CO 5: Analyse inequalities.
19C4ACM2	ALLIED MATHEMATICS - II	CO 1: Describe the concepts of groups, subgroups and normal subgroups. CO 2: Compute the definite integral and construct reduction formula. CO 3: Solve differential equations using Laplace transforms. CO 4: Explain the concepts of correlation, rank correlation coefficient and regression. CO 5: Apply the principle of least squares to fit a straight line and parabola.
19B4ACM2	ALGEBRA AND GRAPH THEORY	CO 1: Recall relations and functions. CO 2: Appraise Eigen values and Eigen vectors. CO 3: Define various types of graphs. CO 4: List out the characterization of trees. CO 5: Apply different algorithms to find the shortest path in graphs.