SRM ARTS AND SCIENCE COLLEGE, KATTANKULATHUR 603 203

DEPARTMENT OF MATHEMATICS

PROGRAMME OUTCOMES

After the completion of programme the students are able to

PO1: Recognize the applications to think critically, logically and analytically in all disciplines of mathematics.

PO2: Develop mathematical skills to analyze the problems.

PO3: Use modern techniques, application of mathematics in various fields for the new developments in software and industries.

PO4: Explain the concepts of mathematical abilities, problem solving skills, creative thinking and communication skill. .

PO5: Categorize the innovative skills, team work so as to meet the future expectation.

PO6: Identify a professional opportunity and create jobs in the eco system.

PROGRAMME SPECIFIC OUTCOMES

After the completion of programme the students are able to

PSO1: Recognize the applications of mathematics in all disciplines.

PSO2: Apply analytical, critical, logical, problem solving skills and innovative technical tools to solve real-life problems.

PSO3: Acquire proficiency in technical skills in the field of Investments sectors and in other professions at national and international.

SRM ARTS AND SCIENCE COLLEGE, KATTANKULATHUR 603 203

DEPARTMENT OF MATHEMATICS

COURSE OUTCOMES

COURSE TITLE: PAPER – I : ALGEBRA   **CODE: TAM1A**

The students will able to

1. Teach the basic ideas on Theory of Equations and able to solve the equations of higher order.

2. Interpret the different types of matrices and obtain their eigen values and eigen vectors.

3. Explain the roots of the polynomial by increasing or decreasing the roots or by removing the second term.

4. Classify the analytical skills in summing up binomial, exponential and logarithmic series.

5. Solve theoretical and applied problems.

6. Solve various types of problems in theory of numbers with the applications of prime and composite numbers.

COURSE TITLE: PAPER – II : TRIGONOMETRY   **CODE: TAM1B**

The students will able to

1. Illustrate trigonometric identities and experience of deriving the identities.

2. Teach trigonometric and inverse trigonometric functions.

3. Solve trigonometric equations.

4. Describe circular and hyperbolic functions of a complex variable.

5. Illustrate the limits of combination of trigonometric functions.

6. Solve trigonometric equations and applications.

COURSE TITLE: PAPER – III :   DIFFERENTIAL CALCULUS   CODE: TAM2A

The students will able to

1. Summarize the basics of differentiation and its applications.

2. Define calculus involving the fundamental tools such as continuity and differentiability.

3. Explain the nth derivative for any function.

4. Teach the maximum and minimum value of functions to two variables.

5. Illustrate radius of curvature, centre of Curvature, evolutes and realize the significance in global context.

6. Explain the angle of intersection of two curves and the angle between the radius vector and the tangent and the asymptotes with special cases and asymptotes by inspection.

COURSE TITLE: PAPER – IV :   ANALYTICAL GEOMETRY   CODE: TAM2B

The students will able to

1. Categorize the basic aspects of conics, straight lines, sphere and cone.

2. Explain the concepts of plane and the straight line for further studies.

3. Teach the angle between the line and the plane, length of the perpendicular From a point to a line.

4. Identify the equation of skew lines

5. Solve the shortest distance between two skew lines.

6. Solve the equation of a plane, straight line, sphere, cylinder and cone

COURSE TITLE: PAPER – V :INTEGRAL CALCULUS　　　　　**CODE: TAM3A**

The students will able to

1. Acquire knowledge of integration, methods and techniques of solving integration.

2. Explain reduction formulae and find the result using this formulae.

3. Solve double and triple integrals and change the order integration.

4. Explain Beta and Gamma function and evaluate the problems using Beta and Gamma function.

5. Teach the concept of gradient, divergence and curl.

6. Identify the length of a curve, area and volume.

COURSE TITLE: PAPER – VI:DIFFERENTIAL EQUATIONS　　　**CODE:TAM3B**

The students will able to

1. Identify linear, non-linear ordinary and partial differential equations.

2. Illustrate the solution of differential equations of the first order and higher degree.

3. Define partial differential equations.

4. Explain simultaneous linear equations with constant coefficients.

5. Solve Lagrange's equations.

6. Describe the problems using Charpit's method and special types of first order equations.

COURSE TITLE: PAPER – VII : TRANSFORM TECHNIQUES   CODE: TAM4A

The students will able to

1. Define the concepts and the properties of Laplace Transforms.

2. Solve the integrals using Laplace Transforms.

3. Determine second order ordinary differential equations using Laplace transform techniques.

4. Solve Fourier series expansions for the given function.

5. Explain the properties of Fourier transforms and Inverse Fourier Transforms.

6. Describe periodic functions in terms of Fourier Series.

COURSE TITLE: PAPER – VIII : STATICS   CODE: TAM4B

The students will able to

1. Define component of a force, coplanar forces, like and unlike parallel forces, moment of a force and couple   with examples.

2. Describe Parallelogram of Forces, Triangle of Forces, Lami's theorem and Varignon's theorem.

3. Explain Friction, Forces of Friction, Cone of Friction, Laws of friction.

4. Teach centre of mass able to find mass centre, hanging body in equilibrium.

5. Solve the tension at any point and discuss the properties of catenary.

6. Illustrate the equilibrium of a uniform homogeneous sting and suspension bridge.

The students will able to

1. Define Numerical techniques which act as powerful tools in scientific computing.

2. Explain Linear algebraic, transcendental equations and interpolation using finite difference formulae.

3. Define the concept of finite differences and summation of series

4. Solve the missing values in the interval by using suitable methods.

5. Explain the solutions of simultaneous linear equations using elimination, Jordan, Crout's and Seidel methods.

6. Identify the interpolation with equal and unequal intervals and able to solve it by suitable methods.

The students will able to

1. Define the concepts of Numerical Differentiation, Numerical integration and Difference Equations.

    Explain the derivatives of the given function using forward, backward difference and Stirling's formulae.

2. Solve integrals of a function using Trapezoidal, Simpson"s, Weddle"s rule.

3. Solve difference equation of linear homogeneous and non homogeneous type.

    Illustrate the numerical solution of ordinary difference equation using Taylor"s, Picard"s and Euler"s method.

4. Explain the numerical solution of ordinary difference equation using Range-Kutta, Milnes and Adams-Bashforth"s Predictor- Corrector method.

COURSE TITLE: ALLIED: MATHEMATICAL STATISTICS-I   **CODE: SBAOA**

The students will able to

1. Define the concepts of sample space, the laws of probability and the Baye's theorem.

2. Teach discrete and continuous probability distributions with moment generating function and probability generating function.

3. Explain characteristic function with uniqueness and inversion theorems.

4. Define the concepts of bivariate distribution.

5. Illustrate correlation, regression and rank correlation coefficient and the concepts of partial and multiple correlations.

6. Teach standard distributions and the inter relationship between distributions.

COURSE TITLE: ALLIED: MATHEMATICAL STATISTICS-II CODE: SBAOB

The students will able to

1. Define basic concepts of sampling theory, sampling distribution and normal distribution.

2. Teach point distribution and able to describe the consistency, efficiency and sufficiency of the estimation.

3. Explain the test of significance and able to solve the problems using t, chi-square and F distribution with respect to population mean and population variance.

4. Illustrate how to test the significance of standard error based on contingency tables.

5. Explain the problems based on analysis of variance.

6. Describe solution using Neymann Pearson lemma and likelihood ratio test.

COURSE TITLE: MATHEMATICS - I (Allied)   CODE: SBAMM

The students will able to

1. Define the Basic ideas of Theory of Equations.

2. Teach Matrices, its applications and method of solving various problems.

3. Explain theoretical and applied problems.

4. Teach basics of differentiation and its applications.

5. Explain trigonometric functions, Hyperbolic functions.

6. Identify the numerical techniques used as powerful tools in scientific computing.

COURSE TITLE: MATHEMATICS - II (Allied)   CODE: SBAMN

The students will able to

1. Define methods of solving ordinary and partial differential equations.

2. Identify the suitable methods of integration and evaluate integrals.

3. Teach Fourier series expansions and the Laplace transformation for the given function.

4. Explain Laplace transform for solving differential equations.

5. Explain concept of gradient to solve the problem which involves normal vectors.

6. Interpret line, surface and volume integral using vector integration.

COURSE TITLE: BIOSTATISTICS - I   CODE: SBAOH

The students will able to

1 . Identify the uses of Biostatistics.

2. Summarize the importance of data collection.

3. Solve the statistical data graphically using frequency distribution.

4. Describe the law of probability.

5. Interpret the statistical data using measure of central tendency

   and dispersion,

6. Relate the correlation.

COURSE TITLE: BIOSTATISTICS - II   CODE: SBAOJ

The students will able to

1. Describe the concepts of Probability.

2. Classify the discrete and continuous distribution.

3. Teach law to apply statistical data.

4. Relate the large and sample and Small sample

5. Compare the different samples of data using various hypothesis testing.

6. Transfer Design statistical analysis using real biochemical data.

COURSE TITLE: STATISTICAL METHODS AND THEIR APPLICATION-I   CODE: SBAOC

The students will able to

1. Identify the basic knowledge on data collection.

2. Compare the Diagram and graph.

3. Teach sampling concept.

4. Explain statistical data.

5. Infer measures location and dispersion.

6. Relate the correlation.

COURSE TITLE: STATISTICAL METHODS AND THEIR APPLICATION-II   CODE: SBAOD

The students will able to

1. Identify the basic concept of probability

2. Summarize the discrete and continuous distribution

3. Relate the properties of distribution

4. Describe the large and small sample problem

5. Classify the statistical tests to get information from the data

6. Teach the important of ANOVA

COURSE TITLE: Biostatistics   **CODE: MENAC**

The students will able to

1. Describe the Biological data using Biostatistics

2. Summarize univariate and bivariate data

3. Teach measures of location and dispersion

4. Explain correlation

5. Compare regression

6. Complete the application of statistical data for data base software.

COURSE TITLE: BUSINESS STATISTISCS   **CODE: CDZ3A**

The students will able to

1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis.

2. Interpret the importance of data collection.

3. Calculate Measures of Central Tendency for the given data.

4. Calculate of Measures of Dispersion with simple problems

5. Illustrate correlation and regression analysis to estimate the relationship between two variables.

6. Construct the techniques and concept of different types of index numbers.

COURSE TITLE: BUSINESS STATISTISCS   **CODE: BS33A**

The students will able to

1. Describe the uses of statistics in business field and society.
2. Discuss classify the uses and limitations of statistical analysis.
3. Calculate Measures of Central Tendency for the given data.
4. Explain correlation analysis and regression analysis to estimate the relationship between two variables.
5. Solve a range of problems using the techniques covered
6. Explain the techniques and concept of different types of index numbers.

COURSE TITLE: Elements of Operation Research   **CODE: CDZ4A**

1. Identify and develop operational research models from the verbal description of the real system.
2. Construct linear programming models and discuss the solution.
3. Describe the decision models and use some solution methods for nonlinear optimization problems.
4. Explain the optimal solution for Transportation problems and Assignment Problems
5. Determining the best strategy and value of the given game model.
6. Solve the Critical path method to improve decision –making and develop critical thinking and objective analysis of decision problems.

COURSE TITLE: Elements of Operation Research   **CODE: BTZ4A**

1. Define and formulate linear programming problems and appreciate their limitations

2. Solve the linear programming problems using appropriate techniques.

3. Explain the decision models and use some solution methods for nonlinear optimization problems.

4. Calculating the transportation models' solutions and infer solutions to the real-world problems.

5. Construct the Critical path method to improve decision –making and develop critical thinking and objective analysis of decision problems.

6. Determining the best strategy and value of the given game model.

COURSE TITLE: BUSINESS STATISTISCS   **CODE: BTZ3A**

1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis.

2. Calculate Measures of Central Tendency for the given data.

3. Calculate of Measures of Dispersion with simple problems

4. Illustrate correlation and regression analysis to estimate the relationship between two variables.

5. Explain time series analysis with example.

6. Construct the techniques and concept of different types of index numbers.

COURSE TITLE: BIOSTATISTICS   CODE: MDKAB

1. Explain the Statistical analysis of Variables.

2. Interpret biostatistics data.

3. Complete the equations used in both parametric and non parametric tests such as F-test, t-test and chi-square test.

4. Calculate the measure of central tendency, dispersion and correlation.

5. Testing based on small sample and large sample.

6. Write a notes on Spread sheets and SPSS

COURSE TITLE: STATISTICAL METHODS AND NUMERICAL METHODS   CODE: SAZ3C

The students will able to

1. Understand the basics in mathematics and the errors in computations.

2. Find the roots of an equation using different methods and Solve the simultaneous linear equations using various methods.

3. Learn numerical differentiation and numerical integration and able to solve the problems.

4. Understand the concepts of sampling, measures of central tendency and dispersion and able to solve the problems.

5. Learn discrete and continuous probability distributions and the standard distributions .

6. Understand the test of significance and able to solve the problems using t, chi-square and F distribution with respect to population mean and population variance and also find the conclusions using analysis of variance.

COURSE TITLE: RESOURCE MANAGEMENT TECHNIQUES   CODE: SAZ5C

The students will able to

1. Formulate real life situations into linear programming problem, analyse and obtain the optimal solutions.

2. Find the optimal solutions for transportation and assignment problems using various techniques.

3. Obtain the optimal expected time for completing the project in PERT/CPM network.

4. Find the optimal sequence of jobs, so that the total elapsed time should be minimum.

5. Find the expected time of waiting in queue in queueing theory.

6. Find the maximum gain in game theory using dominance property.

COURSE TITLE: NUMERICAL METHODS (for B.Sc., ECS)   CODE:TAG3A

The students will able to

1. Apply the appropriate methods of solving the numerical problems with most accuracy.

2. Apply various interpolation methods and finite difference concepts in forecasting.

3. Find the roots of algebraic and transcendental equations using different methods.

4. Solve the simultaneous linear equations using elimination, Jordan and triangularisation method.

5. Understand the concept of principles of least squares and able to solve the problems.

6. Evaluate definite integral using Trapezoidal, Simpson's and Weddle's rule.

COURSE TITLE: PROGRAMMING IN C (for B.Sc., ECS)   **CODE:TAG4A**

The students will able to

1. Implement programs using Functions, Pointers and Structures in C language.

2. Implement files and perform file operations.

3. Develop programming skills using input and output operations.

4. Implement the knowledge of character arrays and strings in executing C Program.

5. Perform the execution of programs written in C language.

6. Identify the C code for a given algorithm.

COURSE TITLE: BUSINESS STATISTICS   **CODE: CDZ3A/MBT3A**

The Students will able to

1. Know the uses of statistics in biochemical field and society.

2. Recognize the importance of data collection and its role in determining scope of inference.

3. Analyse the statistical data graphically using frequency distribution and cumulative frequency distribution.

4. Analyse statistical data using measures of central tendency, dispersion and location.

5. Understand correlation between continuous variables and association between categorical variables.

6. Understand how to apply statistical tests to get information from the data.

COURSE TITLE: ELEMENTS OF OPERATIONS RESEARCH   **CODE: CDZ4A/MBT4A**

The students will able to

1. Define the applications of operations research in business and management.

2. Formulate real life situations into linear programming problem.

3. Find the optimal solutions through graphical methods.

4. Determine the optimal solutions through iterative method.

5. Find the optimal solutions for transportation and assignment problems using various techniques.

6. Find the maximum gain in game theory using dominance property.

COURSE TITLE: BIOSTATISTICS (for B.Sc., Microbiology)   **CODE: TBN4A**

The students will able to

1. Recognize the importance of data collection and its role in determining scope of inference.

2. Analyze the statistical data graphically using frequency distribution and cumulative frequency distribution.

3. Apply the laws of probability to concrete problems.

4. Analyse statistical data using measures of central tendency, dispersion and location.

5. Apply appropriate statistical methods for analyzing one or two variables.

6. Calculate and interpret confidence intervals for population means and proportions and interpret statistical analysis with real biological data.

COURSE TITLE: THEORITICAL FOUNDATIONS OF COMP. SCIENCE (for M.Sc., CS)   PED1A

The students will able to

1. Understand the application of discrete structures in different fields of computer.

2. Learn mathematical logics with different connectives and quantifiers, permutations and combinations.

3. Acquire knowledge in division algorithm, congruence relation and also in group and graph theory.

4. Explain the basic concepts of finite automata and regular expressions

5. Describe the types of grammar and derivation tree and able to test the equivalence of pushdown automata.

6. Understand the simplification of context free grammar and context-free languages.

COURSE TITLE: MATHEMATICS-I (for M.Sc., CST)   CODE: CTM1A

The students will able to

1. Learn binomial, exponential and logarithmic series and able to solve the problems on summation also able to find the coefficients using these series.

2. Find the expansions for sinnx, cosnx and tannxand also able to find the expansions for $\sin^n x$ and $\cos^n x$.

3. Find the power series expansions of sinx, cosnx and tannx.

4. Understand hyperbolic and inverse hyperbolic functions and also logarithm of a complex number and able to solve problems in this section.

5. Learn the applications of differential calculus and also to find the radius of curvature, evolute, involute and envelope for the given curve.

6. Find the maximum and minimum value of a function of two variables also to find the Taylor's series expansion for the given function.

COURSE TITLE: MATHEMATICS-II (for M.Sc., CST)   CODE: CTM2A

The students will able to

1. Learn the basic ideas on Theory of Equations and able to solve the equations of higher order also find the roots of an equation using Horner's method.

2. Solve reciprocal equation under different conditions.

3. Evaluate double and triple integrals and able to find the solution by changing the order of integration.

4. Find the area and volume of a solid.

5. Learn the concept of gradient , divergence and curl and able to solve the problem which involves normal vectors.

6. Interpret line, surface and volume integral using vector integration.

COURSE TITLE: COMPUTER ORIENTED MATHEMATICS. (for M.Sc., CST)   CTC3A

The students will able to

1. Learn mathematical logics with different connectives and quantifiers, permutations and combinations and able to solve the problems.

2. Understand the concept of mathematical induction, congruence equations and Euclidean algorithm.

3. Acquire knowledge in group theory and fields.

4. Find the roots of an equation by various methods also able to find the complex roots.

5. Solve the simultaneous linear equations using elimination, Jordan, Decomposition and Seidel methods.

6. Learn the basics in numerical differentiation and integration and find the solutions of definite integral problems using Trapezoidal and Simpson's rule.

COURSE TITLE: MATHEMATICS FOR COMPUTER SCIENCE(for MCA)　　　　　**PEG1A**

The students will able to

1. Learn mathematical logics with different connectives and quantifiers, theory of inference for statement and predicate calculus.

2. Understand the basic concepts of set theory, relations and functions.

3. Study the basic concepts of group theory, grammars and languages.

4. Find the roots of an equation and solve the simultaneous linear equations using various methods.

5. Learn the basics in numerical differentiation and integration and able to evaluate using Trapezoidal, Simpson's and Romberg's methods.

6. Solve differential equation problems using Taylor's, Euler's, R-K and Predictor-corrector methods.

COURSE TITLE: STATISTICAL METHODS (for MCA)　　　　　`　　　　　**PEG2A**

The students will able to

1. Understand the concepts of sample space, the laws of probability and the Baye's theorem and learn discrete and continuous random variables.

2. Learn bivariate distribution and the standard distributions and able to solve the problems in different distributions.

3. Find correlation, regression and rank correlation coefficient and the concepts of partial and multiple correlations.

4. Learn the basic concepts in sampling and the various methods of sampling.

5. Understand the test of significance and able to solve the problems using t, chi-square and F distribution with respect to population mean and population variance and also find the conclusions using analysis of variance.

6. Solve the problems based on analysis of variance.

COURSE TITLE: Statistics – I	**CODE: SP3AA**

The students will able to

1 . Describe the sample survey

2. Interpret the presentation of data

3. use the properties of diagram and graph

4. Explain   measures of location and measure of dispersion.

5. Compare different types of the correlation.

6.   Teach association of attributes.

COURSE TITLE: MATHEMATICAL STATISTICAL – I	**CODE: SM3AC**

The students will able to

1. Describe the basic concept of probability

2.   Summarize distribution function

3. Teach characteristics function

4. Explain correlation and regression

5. Compare bivariate distribution

6. Compare discrete and continuous distribution.

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