

SREE AYYAPPA COLLEGE FOR WOMEN, CHUNKANKADAI.

M. Sc. MATHEMATICS

Teaching Plan (2020 - 2021)

PROGRAMME OUTCOMES (POs)

PO No	Upon completion of the M. Sc Degree Programme, the graduates will be able to:
PO - 1	Inculcate critical thinking to carry out scientific investigation objectively.
PO - 2	Equip the student with skills to analyse problems, formulate an hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.
PO - 3	Imbibe effective scientific and / or technical communication in both oral and writing.
PO - 4	Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in the subject concerned.
PO - 5	Create awareness to become an enlightened citizen with commitment to deliver one's responsibilities within the scope of bestowed rights and privileges.
PO - 6	Development of a set of competencies in order to enhance and promote the growth of multicultural sensitivity within universities.
PO - 7	Ability to think, acquire knowledge and skills through logical reasoning and to inculcate the habit of self-learning throughout life, through self- paced and self-directed learning aimed at personal development.
PO - 8	Prepare students for pursuing research or careers in industry in concerned subject and allied fields.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO	Upon completion of the M. Sc Degree Programme, the graduates will be able to	PO Addressed
PSO - 1	Have strong foundation in core areas of Mathematics, and able to communicate Mathematics effectively.	PO – 7

PSO - 2	Evaluate hypotheses, theories, methods and evidence within their proper contexts.	PO – 2
PSO - 3	Solve complex problems by critical understanding, analysis and synthesis.	PO – 4, PO – 6
PSO - 4	Select, interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and internet.	PO – 5
PSO - 5	Provide a systematic understanding of the concepts and theories of mathematics and their application in the real world- to an advanced level.	PO – 1, PO – 3
PSO - 6	Recognize the need to engage in lifelong learning through continuous education, and research leading to higher degrees like PhD, DSc etc.	PO – 8

Semester : I

Name of the course: **ALGEBRA-I**

Core : **1**

Sub code: **PMAM11**

Total Hours : **90 hours**

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand a counting Principle, Normal subgroups and Quient Groups ,homomorphism.	PSO. 3	U
Co. 2	Understand the automorphisms, and Cayley's theorems and Solvable groups	PSO. 3	An
Co. 3	Understand the Permutation groups and another counting Principle.	PSO. 4	Ap
Co. 4	Interpretation of Sylow's Theorems	PSO. 4	Sy
Co. 5	Get an insight of the direct products and finite abelian groups.	PSO. 3	U

Semester : I

Name of the course: **ANALYSIS I**

Core – **2**

Sub code: **PMAM12**

Total Hours: **90**

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the Metric Space, Compact sets, Perfect sets, cantor sets and Connected sets.	PSO. 3	U
Co. 2	Understand the convergence sequence and Cauchy sequence.	PSO. 3	An
Co. 3	Solve Root test and Ratio test.	PSO. 3	Ap
Co. 4	Interpretation of Continuity and Connectedness.	PSO. 4	Sy
Co. 5	Get an insight of the derivative of a real function and mean value theorem.	PSO. 3	U

Semester : I

Name of the course: ANALYTIC NUMBER THEORY

Core - 3

Sub code : PMAM13

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the General concept of divisibility	PSO. 3	K
Co. 2	Understand the ideas of Mobius function and Euler totient function	PSO. 3	U
Co. 3	Acquire knowledge about multiplication function and the Mangoldt function.	PSO. 5	Ap
Co. 4	Understand the averages of arithmetical functions	PSO. 4	An
Co. 5	Get an insight of the distribution of prime numbers	PSO. 5	U

Semester : I

Name of the course: NUMERICAL ANALYSIS

Core - 4

Sub Code : PMAM14

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Apply various interpolation methods and finite difference concepts.	PSO. 6	U
Co. 2	Work out numerical differentiation whenever and wherever routine methods are not applicable.	PSO. 3	U
Co. 3	Work out numerical integration whenever and wherever routine methods are not applicable.	PSO. 4	Ap
Co. 4	Work numerically on the ordinary differential equations using different methods through the theory of finite differences.	PSO. 2	An
Co. 5	Apply numerically the ordinary differential equations using predictor corrector Method.	PSO. 2	Ap

Semester : I

Name of the course: ORDINARY DIFFERENTIAL EQUATIONS

Core - 5

Sub Code : PMAM15

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the General solution of the Homogeneous Equations and The method of variation of parameters.	PSO. 3	U
Co. 2	Solving power series solutions, Series solution of first order equations and Second order equations.	PSO. 3	An
Co. 3	Solve Regular singular points – Legendre polynomials- Properties of Legendre polynomials.	PSO.3	Ap
Co. 4	Interpretation of Bessel functions and the Gamma functions.	PSO.4	Sy
Co. 5	Get an insight of Homogeneous linear systems with constant coefficients.	PSO.3	U

Semester : II

Name of the course: ALGEBRA-II

Core - 6

Sub Code :	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand ring homomorphisms, ideal and quotient rings, and the field of quotients of an integral domain.	PSO. 3	U
Co. 2	Learn and difference between Euclidean rings and a particular Euclidean ring.	PSO. 3	U
Co. 3	To learn polynomial rings, polynomials over rational field and polynomial rings over commutative rings	PSO. 3	Ap
Co. 4	Analyze certain radicals of a ring, Jacobson radical of a ring, semi simple ring and nil radical, Primary ring.	PSO. 5	An
Co. 5	Get an insight of the quasi regular, J semi simple and direct sum of rings.	PSO. 3	U

Semester : II

Name of the course: ANALYSIS-II

Core - 7

Sub Code : PMAM22

Total Hours: 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the integration and Differentiation	PSO. 3	U
Co. 2	Understand the sequence and series functions. Also study uniform convergence.	PSO. 3	An
Co. 3	Solve integration and uniform convergence problems.	PSO. 3	Ap
Co. 4	Interpretation of stone weierstrass theorem and power series.	PSO. 4	Sy
Co. 5	Get an insight of the algebraic completeness of the complex field.	PSO. 3	U

Semester : II

Name of the course: CLASSICAL MECHANICS

Core : 8

Sub code: PMAM23

Total Hours : 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Recall and relate the basic notions of the mechanical system.	PSO-1	R
Co. 2	Derive Lagrange's equations from D'Alembert's and apply these equations to holonomic and non holonomic systems.	PSO-3	U
Co. 3	Compare Lagrange's equation and Hamilton's equations.	PSO-2	R
Co. 4	Acquire knowledge about the equivalent one-dimensional problem and classification of orbits	PSO – 1	U
Co. 5	Analyze the motion in time in the Kepler problem	PSO – 3	R

Semester : II

Name of the course: DIFFERENTIAL GEOMETRY

Core - 9

Sub Code : PMAM24

Total Hours: 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the theory of space curves	PSO – 1	U
Co. 2	Apply the concept in different families of space curves .	PSO – 3	A
Co. 3	Understand Helicoids and Metrics	PSO – 5	U
Co. 4	Analyze the properties of a surface of canonical Geodesics equations.	PSO – 2	R
Co. 5	Understand Geodesics on surfaces and curvature of plane curves and their properties, the various intrinsic concepts of Differential Geometry - Skill Development.	PSO - 5	U

Semester : II

Name of the course: GRAPH THEORY

Core -10

Sub Code : PMAM25

Total Hours: 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Recall and relate graph and its operations	PSO. 4	R, U
Co. 2	Demonstrate the structure Trees and connectivity	PSO. 5	An
Co. 3	Analyze the euler tour, Hamilton cycle and matching	PSO. 5	An
Co. 4	Implement the properties of colouring and independent sets	PSO. 2	An
Co. 5	Get an insight of vertex colouring	PSO. 2	Ap, U

Semester : II

Name of the course: DISCRETE MATHEMATICS

Core – Elective-1

Sub Code : PMAE22

Total Hours: 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand Propositional Logic, Propositional equivalence and Predicates and quantifiers.	PSO. 1	U
Co. 2	To learn Basics of counting, The Pigeonhole principle and Generalized permutation and combination.	PSO. 3	An
Co. 3	To learn Relation and their properties, n-ary relations and their applications, representing relation and closures of	PSO. 3	Ap
Co. 4	Interpretation of Boolean functions and Representing Boolean functions..	PSO. 4	Sy
Co. 5	Get an insight of Logic Gates and Minimization of logic gates.	PSO. 3	U

Semester : III

Name of the course: MEASURE AND INTEGRATION

Core - 11

Sub Code : PMAM31

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Explain the lebesgue measure and lebesgue measurable sets.	PSO - 1	R,U
Co. 2	Derive the properties of lebesgue measurable function.	PSO - 3	A
Co. 3	Illustrate the relation between Riemann integral and the lebesgue integral of bounded and non-negative functions.	PSO - 2	R,U
Co. 4	Interpret differentiation of indefinite integral.	PSO - 1	U
Co. 5	Express the properties of general measure space and prove Radon - Nikodym theorem.	PSO - 2	R
Co. 6	Generalizes The Concept Of Integration Using Measures And Develop Analytical Thinking - Skill Development.	PSO-1,2	U,R

Semester : III

Name of the course: TOPOLOGY-I

Core - 12

Sub Code : PMAM32

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Demonstrate how to generate topology from the bases and sub bases.	PSO. 1	K
Co. 2	Demonstrate the structure of Product Topology	PSO. 5	An
Co. 3	Identify the continuity of the function and Exemplify metric topology.	PSO. 2	An
Co. 4	Implement the properties of connected to prove the generalized version of theorems on R to these topological spaces.	PSO. 2	An

Co. 5	Get an insight of Limit point Compactness and Local compactness.	PSO. 2	U
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Semester : III

Name of the course: ADVANCED ALGEBRA-I

Core - 13

Sub Code : PMAM33

Total Hours: 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Acquire knowledge about bases and dimension	PSO – 2	R
Co. 2	Understand the linear transformation using matrices	PSO – 4	U
Co. 3	Understand the polynomial ideals and the prime factorization of polynomials	PSO – 1	U
Co. 4	Acquire knowledge about characteristic values and annihilating polynomials	PSO – 2	R
Co. 5	Differentiate the triangulazation and diagonalization	PSO – 1	U

Semester : III

Name of the course: OPERATION RESEARCH

Core - 14

Sub Code : PMAM34

Total Hours: 75

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Recall the definition of the transportation model,non transportation model and the assignment model.	PSO. 4	R, U
Co. 2	Solving minimal spanning tree algorithm,shortest route problem ,maximum flow model,CPM and PERT.	PSO. 3	An
Co. 3	Solve Integer programming solutions and algorithms	PSO.3	Ap

Co. 4	Interpretation of basic elements of an inventory model,deterministic models:Item stock model with and without price breaks and multiple items stock models with storage limitations,Probabilistic models.	PSO.4	Sy
Co. 5	Understand Queuing theory models.	PSO.3	An

Semester : III

Name of the course: RESEARCH METHODOLOGY

Core - 15

Sub Code : PMAM35

Total Hours: 60

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand research product,difference between a dissertation and a thesis,basic requirements of a research degree,writing proposal and ethical considerations.	PSO. 3	U
Co. 2	Learn and difference between components of a research project and different components of a research project,literature review,methodology.	PSO. 3	U
Co. 3	To learn Some special distributions,the gamma and chi square distribution,and the normal distribution.	PSO. 3	Ap
Co. 4	Analyze sampling theory transformation of variables, T and F distributions.	PSO. 5	An
Co. 5	Get an insight of the random variables.	PSO. 3	U

Semester : III

Name of the course: CALCULAS OF VARIATION AND INTEGRAL EQUATIONS

Sub Code : PMAE32

Core – Elective-2

Total Hours: 60

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the maxima and mininma ,calculus of variations and applications,and the simplestcase with examples.	PSO. 3	U

Co. 2	Learn Lagrange's multipliers, the variational notations, variable end points .	PSO. 3	An
Co. 3	Learn integral equations, relation between differential and integral equations and the green's functions.	PSO. 3	U
Co. 4	Interpretation of the Fredholm equations with separate kernels with examples.	PSO. 4	An
Co. 5	Get an insight of Hilbert Schmidt theory and related problems.	PSO. 3	U

Semester : IV

Name of the course: FUNCTIONAL ANALYSIS

Core - 16

Sub Code : PMAM41

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the Banach spaces	PSO. 3	U
Co. 2	Understand the natural imbedding.	PSO. 3	An
Co. 3	Solve Hilbert space problems.	PSO. 3	Ap
Co. 4	Interpretation of conjugate space and adjoint.	PSO. 4	Sy
Co. 5	Get an insight of an operators.	PSO. 3	U

Semester : IV

Name of the course: COMPLEX ANALYSIS

Core - 17

Sub Code : PMAM42

Total Hours: 90

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Define conformal analytic function and Power series.	PSO.3	U
Co. 2	Understand the linear group and also study the Cross ratio Symmetry.	PSO.3	An
Co. 3	Solve Cauchy's problems and also study the Cauchy's theorem	PSO.3	Ap
Co. 4	Interpretation of the integral formula and	PSO.4	Sy
Co. 5	Get an insight of the Residue theorems and the argument principle	PSO.3	U

Semester : IV

Name of the course: **ADVANCED ALGEBRA-II**

Core - 18

Sub Code : **PMAM43**

Total Hours: **75**

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Develop the algebraic structure of extension fields	PSO-3	U,E
Co. 2	Explain the roots of polynomials	PSO-2	U
Co. 3	Explain the elements of Galois theory	PSO-4	U
Co. 4	Acquire knowledge about finite fields and explain Wedderburn's theorem.	PSO – 1,2	E
Co. 5	Analyze a theorem of Frobenius and the four square theorem.	PSO – 3	An

Semester : IV

Name of the course: **TOPOLOGY-II**

Core - 19

Sub Code : **PMAM44**

Total Hours: **60**

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Understand the Separation axioms and countability axioms.	PSO. 3	U
Co. 2	Learn Urysohn lemma and normal spaces. Differentiate between Hausdorff spaces and normal spaces.	PSO. 3	An
Co. 3	Learn and differentiate between Urysohn metrization theorem and Tietz extension theorem.	PSO. 3	U
Co. 4	Interpretation of Tychonoff theorem and Local finiteness.	PSO. 4	An
Co. 5	Get an insight of Baire spaces and its difference of Hausdorff and normal spaces	PSO. 3	U

Semester : IV

Name of the course: PROJECT

Core - 20

Sub Code : PMAP41

Total Hours: 120

Co. No	Upon Completion of the course the Students will be able to :	PSO	Cognitive Level
Co. 1	Develop understanding of research methodology and its applications	PSO. 6	U
Co. 2	Understand the different methods of data collection and its interpretation	PSO. 6	AP
Co. 3	Develop analytical skills in generalization of things and concepts	PSO. 6	An