

தரமாய் கற்று வளமாய் வாழ..!



# ST ALPHONSA COLLEGE OF ARTS AND SCIENCE



An Institution run by the Syro Malabar Catholic Diocese of Thuckalay

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

Soosaipuram, Karinkal, Kanyakumari District, Tamilnadu - 629 157

Website: [www.stalphonsa.edu.in](http://www.stalphonsa.edu.in)

Email: [stalphons2014@gmail.com](mailto:stalphons2014@gmail.com)

Ph: 04651 - 255540

Mob: 94449 68233

**DEPARTMENT  
OF  
MATHEMATICS  
UNDER GRADUATE PROGRAMME  
&  
COURSE OUTCOME  
ACADEMIC YEAR 2024 - 2025**

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## UNDER GRADUATE PROGRAMME OUTCOMES:

**PO1: Disciplinary Knowledge:** Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

**PO2: Critical Thinking:** Capability to apply analytic thought to a body of knowledge; analyze and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

**PO3: Problem Solving:** Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

**PO4: Analytical Reasoning:** Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints.

**PO5: Scientific Reasoning:** Ability to analyse, interpret and draw conclusions from quantitative / qualitative data; and critically evaluate ideas, evidence, and experiences from an open minded and reasoned perspective.

**PO6: Self-directed & Lifelong Learning:** Ability to work independently, identify and manage a project. Ability to acquire knowledge and skills, including "learning how to learn", through self-placed and self-directed learning aimed at personal development, meeting economic, social and cultural objectives.

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## II B.Sc MATHEMATICS

Sem	Part	List of Courses	Subject code	Credit	Hours per week (L/T/P)
II	Part-III	3.3. Core Course CC5: Vector Calculus and Applications	<b>EMMA31</b>	4	4
		3.4. Core Course CC6: Differential Equations and Applications	<b>EMMA32</b>	4	4
		3.5. Elective Course EC3: Statistics I	<b>EEST31</b>	4	4
	Part-IV	3.6. Skill Enhancement Course SEC4: Computational Mathematics	<b>ESMA31</b>	2	2
		3.8. Naan Mudhalvan: Microsoft Office Essential (Substitute Course: Mathematics for Competitive Examination IV)		2	2

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**Subject: Vector calculus and applications**

**Subject code: EMMA31**

Students will be able to

Sl.No	Course Outcome	CO No.
1	Find the derivative of vector and sum of vectors, product of scalar and vectorpoint function and to Determine derivatives of scalar and vector products	BMVCP-01
2	Applications of the operator 'del' and to Explain solenoidal and irrotational vectors	BMVCP-02
3	Evaluate simple line integrals	BMVCP-03
4	Evaluate surface integrals and volume integrals.	BMVCP-04
5	Verify the theorems of Gauss, Stoke's and Green's.	BMVCP-05

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**Subject Code: EMMA32**

**Subject: Differential Equations and Applications**

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

SL.No	Course Outcome	Code
1.	Determine solutions of homogeneous equations, non-homogeneous equations of degree one in two variables, solve Bernoulli's equations and exact differential equations.	BMDEA 01
2.	Find the solutions of equations of first order but not of higher degree and to Determine particular integrals of algebraic, exponential, trigonometric functions and their products.	BMDEA 02
3.	Find solutions linear equations of second order and know some applications.	BMDEA 03
4.	Form a PDE by eliminating arbitrary constants and arbitrary functions, find complete, singular and general integrals, to solve Lagrange's equations.	BMDEA 04
5.	Explain standard forms of PDE and find solutions.	BMDEA 05

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**Subject Code: EEST31**

**Subject: Statistics I**

On Successful completion of this course, the students will be able to:

SL.No	Course Outcome	Code
1.	Find coefficient of dispersion, moments, skewness and kurtosis	BMS 01
2.	Find Karl Pearson's correlation and rank correlation	BMS 02
3.	Fit a straight line and parabolic curve by the method of least squares and find the regression lines and regression coefficients	BMS 03
4.	Develop the statistical techniques used in the theory of attributes and to analyze consistency of data	BMS 04
5.	Find the Index number	BMS 05

**Subject: Computational mathematics**

**Subject code: ESMA31**

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

Sl.No	Course Outcome	Code
1	Describe the roots of algebraic equations using different methods like iteration method and Regula Falsie method.	BMCM 01
2	Find the real root of an equation by Bisection method, Newton-Raphson method and Horner's method.	BMCM 02
3	Solve a given system of simultaneous equation by using substitution and elimination methods.	BMCM 03
4	Solve a given system of simultaneous equation by using iteration method.	BMCM 04
5	Find numerical solutions of Partial Differential.	BMCM 05

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## III B.Sc MATHEMATICS

Sem	Subject number	Subject Status	Subject name	Subject Code	Hrs/ weeeek	Credit
V	27	Core-V Paper-VII	LinearAlgebra	CMMA 51	5	4
	28	Core-VI Paper-VIII	RealAnalysis	CMMA52	5	4
	29	Core-VII Paper-IX	Statics	CMMA 53	5	4
	30	Core-VIII Paper-X	Integral Transforms and Z Transforms	CMMA 54	5	4
	31	Major Elective-I Paper-XI	Discrete Mathematics	CEMA 52	4	4
	32	Major Elective -II Paper-XII	Operations Research-I	CEMA 51	4	4

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**Subject: Linear Algebra**

**Subject Code: CMMA51**

On Successful completion of this course, the students will be able to:

SL.No	Course Outcome	Code
1.	Explain the definitions and general properties of vector spaces. Also to explain subspace. They know where to apply fundamental theorem of homomorphism.	BMLA 01
2.	Determine the span of a set and to check whether the given set is Linearly dependent or not. Also to find basis and dimensions.	BMLA 02
3.	Illustrate and apply Rank Nullity theorem. Explain the definitions and examples of inner product space. Apply Gram Schmidt Orthogonalization process.	BMLA 03
4.	Construct matrices and also to summarize the elementary transformations. Determine the Inverse of matrix and rank of a matrix. To make use of Cayley Hamilton Theorem.	BMLA 04
5.	Determine Eigen Values and Eigen Vectors. Identify bilinear forms and quadratic forms. Also To deduce Diagonal form from Quadratic form.	BMLA 05



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**Subject Code: CMMA52**

**Subject: Real Analysis**

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

SL.No	Course Outcome	Code
1.	Explain about Metric spaces and to construct an open ball .Also to interpret interior	BMRA 01
2.	Interpret about closed sets and to find closure. To determine limit points. Analyze about complete metric space.Discuss about Cantor's intersection theorem and Baire's Category theorem	BMRA 02
3.	Summarize continuity. Illustrate about uniform continuity	BMRA 03
4.	Explain about connectedness and to deduce the connected subsets of R. To obtain the relationship between connectedness and continuity	BMRA 04
5.	Illustrate about compactness and to find the connected subsets of R. Illustrate and make use of Heine Borel Theorem .To determine the relationship between compactness and continuity	BMRA 05

**Subject code: CMMA53**

**Subject: Statics**

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

Sl.No.	Course outcome	Code
1	Understand the procedure for analysis of static objects, the concepts of force, moment and equilibrium of a particle	BMSS-01
2	Solve problems on equilibrium of three forces acting on rigid body	BMSS-02
3	Develop a working knowledge to handle practical problems	BMSS-03
4	Describe friction and its causes	BMSS-04
5	Develop equilibrium relationships for rigid bodies acted on by external forces and moments	BMSS-05

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**Subject: Integral transforms and Z transforms**

**Subject code: CMMA54**

**On successful completion of the course, the students should be able to**

S.NO	Course Outcome	CODE
1	Apply Fourier transforms and to explain the properties.	BMIT 01
2	Solve problems on infinite Fourier cosine and Sine Transforms	BMIT 02
3	Identify and solve Finite Fourier transforms	BMIT 03
4	Illustrate Z transforms and its properties.	BMIT 04
5	Utilize inverse Z transforms to solve difference equations.	BMIT 05

**Subject Code: CEMA52**

**Subject: Discrete Mathematics**

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

SL.No	Course Outcome	Code
1.	Illustrate and use the statements, notations and connectives. Construct truth table and utilize conditional and biconditional statements.	BMDM 01
2.	Analyze and explain predicate Calculus.	BMDM 02
3.	Elaborate Groups and monoids. Also to develop Group codes.	BMDM 03
4.	Construct Lattices and Special lattices. Analyze and explain Boolean algebra.	BMDM 04
5.	Convert From one form to another form (Decimal, Binary, Octal, Hexadecimal). Evaluate Binary addition, subtraction, multiplication and division.	BMDM 05

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**Subject Code: CEMA51**

**Subject: Operational Research I**

On Successful completion of this course, the students will be able to:

SL.No	Course Outcome	Code
1.	Solve Linear Programming Problem by making use of Graphical method, Simplex method.	BMOR 01
2.	Interpret the concept of duality. Classify primal and dual problems. Utilizing the concept of duality, solve problems on dual simplex method.	BMOR 02
3.	Solve Transportation problems by making use of North – west corner rule, Matrix- Minima method, Vogel's Approximation rule. Evaluate Degeneracy and unbalanced transportation problems.	BMOR 03
4.	Determine the solution for Assignment problems	BMOR 04
5.	Solve sequencing problems	BMOR 05