



# SACRED HEART COLLEGE (AUTONOMOUS)

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Every Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 \* Affiliated to Thiruvalluvar University, Vellore \* Autonomous since 1987

Accredited by NAAC (4<sup>th</sup> Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Name of the Course	Course Code	Name of the Program	Activities with direct bearing on Employability/ Entrepreneurship/ Skill development	Year of introduction
Algebra and Trigonometry	M117	B Sc Mathematics	<b>Employability:</b> Contents: Summation of series, Theory of Equations, Trigonometry, Activities: To evaluate the summation of various series, understand the importance of real and complex roots, to find the expansion of Trigonometric function, to understand the relation between circular and hyperbolic function through Problem Solving , Assignments and tests.	2021-22
Integral Calculus	M214	B Sc Mathematics	<b>Employability:</b> Contents: Integration of Rational Functions, Integration of Trigonometric Functions, Definite Integrals, Double and Triple Integrals, Improper Integrals . Activities: To impart the techniques by solving the problems on integration of Rational	2021-22

			function, to understand the techniques to solve such problems, to apply the Bernoulli's formula to get the solution of the integral of the function, to understand the concept of double and triple integrals, Beta and Gamma function by solving the Assignment problems and doing class tests	
Differential equations and Fourier series	M215	B Sc Mathematics	<p><b>Employability:</b>  Contents: Differential Equations of First Order, Linear Equations of Higher Order, Partial Differential Equations, Applications of Differential Equations, Fourier Series.  Activities: : Problems Solving related to ordinary as well as partial differential equations, to learn various techniques of getting exact solutions of certain solvable first order differential equations and linear differential equations of second order, to learn about solution of first order linear partial differential equations using Lagrange's method, to know how to solve second order linear partial differential equations with constant coefficients, to formulate</p>	2021-22

			mathematical models in the form of ordinary differential equations and to get the solution of the problem	
Vector Calculus	M315	B Sc Mathematics	<b>Employability:</b> Contents: Plane, Straight line, Laplace Transforms and Fourier Transforms. Activities: Oral quiz to understand the definition of Scalar and Vector point's functions, to find the directional derivative of a Scalar point function, to find the solenoidal and irrotational of the vector point function, to evaluate the line integrals, surface integrals and volume integrals and to verify Greens', Gauss and Stokes theorem. Class tests and Assignments to strengthen the Problems solving techniques.	2021-22
Solid Geometry and transforms	M316	B Sc Mathematics	<b>Employability:</b> Contents: Plane, Straight line, Laplace Transforms and Fourier Transforms. Activities: To relate between plane and straight line in 2d and 3d., to relate two dimensional, three dimensional geometry and solve problems in	2021-22

			<p>these areas , to analyze the uses of solid geometry in different scientific fields and solving Problems in ODE using Laplace transforms, Training the Students in mastering the techniques of Fourier transforms</p> <p>Fourier transforms, convolution theorem and solving problems by Fourier transform.</p>	
Numerical Methods	M415	B Sc Mathematics	<p><b>Employability:</b></p> <p>Contents: Transcendental and Polynomial Equations, System of linear Algebraic Equations, Interpolation and approximation, Numerical Differentiation, Numerical Integration.</p> <p>Activities: To obtain numerical solution to algebraic and transcendental equation, finding numerical solutions of system of linear equations and checking the accuracy of the solution.</p> <p>to learn about various interpolating and extrapolating methods to find numerical solution, to understand the concept of numerical differentiation and evaluating the integrals by using Trapezoidal and</p>	2021-22

			Simpson's formula. Assignments are given	
Algebraic Structures - I	M416	B Sc Mathematics	<p><b>Employability:</b>  Contents: Groups, Finite groups, subgroups, Cyclic and permutation Groups, Isomorphism, Cosets and Lagrange's Theorem, External Direct Products, Normal Subgroups and Factor Groups, Group Homomorphism's and finite Abelian Groups.  Activities: To learn about the fundamental concept of groups, subgroups and related theorems and knowing the concept of cyclic and permutation group and its properties, isomorphic theorem and Lagrange's theorem, the concept of external direct products and its properties to understand the concept of finite abelian group and properties of homomorphism, Problem Solving and assignments</p>	2021-22

			are given to the students on these topics.	
Algebraic Structures - II	M541	B Sc Mathematics	<b>Employability :</b> Contents: Rings and Integral Domains, Ideals and Factor Rings, Ring Homomorphism and Polynomial Rings, Factorization of Polynomials, Divisibility in Integral Domains Activities: To analyze and demonstrate examples of ideals and factor rings, to learn the concepts of isomorphism and homomorphism for groups and rings, to understand the various canonical types of groups and canonical types of rings through Assignments	2021-22

Real analysis - I	M542	B Sc Mathematics	<p><b>Employability:</b>  Contents: Real Number System, Pointg set topology, Limits and Continuity, Continuity, Derivatives.  Activities: Oral Quiz to o understand the basic properties of real number system such as least upper bound properties and Archimedean properties, open set, closed set, connected sets, continuous set adherent points and accumulation points, class tests to study the Bolzano’s theorem and Fixed point theorem, concept of derivatives of real valued function and related theorems such as Rolle’s theorem, Mean value theorem and Taylor’s formula..</p>	2021-22
Probability and Statistics	M544	B Sc Mathematics	<p><b>Employability:</b>  Contents:  Probability,Random variables and Distribution functions, Mathematical Expectation and Generating functions, Discrete and Continuous Distributions,Correlation and Regression.  Activities:  understanding the basic concepts of probability, discrete and continuous random variable and their probability</p>	2021-22

			distribution.mathematical expectation and generating function and their properties, Binomial, Poisson, normal, uniform and gamma distribution through problems solving, calculatinhg the correlation coefficient, rank correlation and fitting of regression lines by least square method.	
Real Analysis II	M644	B Sc Mathematics	<b>Employability:</b> Contents: Test of convergence, rearrangement of series, connectedness and compactness Activities: Finding the difference between Continuous and Uniformly Continous Functions, Make students to understand many properties of the real line and that of sequence and infinite series by class tests and oral quiz.	2021-22
Complex Analysis II	M645	B Sc Mathematics	<b>Employability:</b> Contents: Test of convergence, rearrangement of series, connectedness and compactness Activities: Significance of differentiability and analyzing of complex function, Cauchy-Riemann equations, concept of conformal mapping and cross ratio and fixed points of	2021-22



			<p>bilinear transformation, role of Cauchy theorem and Cauchy integral form in evaluation of contour integrals, fundamental theorem of algebra ,Taylor and Laurent series expansion of analytic function, classify the nature of singularities, poles and residues, application of Cauchy residue theorem.</p>	
<p>Mathematics for Competitive Examinations-II</p>	NMA604	B Sc Mathematics	<p><b>Employability:</b>            Contents: Profit and loss, Partnership, Boats and Streams, Calendar, clocks, true discount, tabulation and bar graphs.            Activities: Solving more Problems through Assignments and class tests, acquiring knowledge about profit and loss, problem on trains, boats and stream, problems on calendars, Probability and data interpretation problems which helps to clear competitive examinations.</p>	2021-22