

Anjuman Khairul Islam's
Poona College of Arts, Science and Commerce, Pune
Department of Mathematics

Programme/Programme Specific/Course Outcomes

Sr. No.	Programme	Duration
1	B.Sc. Mathematics	3 years
2	B.A. Mathematics	3 years

Sr. No.	Class	Course	Duration
1	F.Y.B.Sc.	M-I, M-II, M-III	1 years
2	S.Y.B.Sc.	M-I, M-II, M-III	2 Semester 6 months each
3	T.Y.B.Sc.	M-I To M-IX	2 Semester 6 months each
4	F.Y.B.A.	M-I	1 years
5	S.Y.B.A.	M-I	1 years
6	T.Y.B.A.	M-I To M-V	1 years
7	F.Y.B.Sc.(CS)	M-I, M-II, M-III	1 years
8	S.Y.B.Sc. .(CS)	M-I, M-II, M-III	2 Semester 6 months each

Program Outcomes: POs are statements that describe what the students graduating from any of the educational programs should be able to do.

Program Specific Outcomes: PSOs are statements that describe what the graduates of a specific educational program should be able to do.

1. Title of Programme :B.Sc. Mathematics

PSO1:A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays ,state important facts resulting from their studies.

PSO2:A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.

PSO3:A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.

PSO4:A student be able to apply their skills and knowledge ,that is, translate information presented verbally into mathematical form, select and use appropriate mathematical

formulae or techniques in order to process the information and draw the relevant conclusion.

PSO5: A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture.

2. Title of Programme : B.A. Mathematics

PSO1: A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.

PSO2: A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.

PSO3: A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.

PSO4: A student be able to apply their skills and knowledge, that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.

Course Outcomes: COs are statements that describe what students should be able to do at the end of a course.

1. Title of Course :F.Y. B.Sc./B.A Mathematics M-I (Algebra and Geometry)

CO1: Student should be able to revise sets and relate it with Equivalence relation and classes, using partitions of sets.

CO2: Student should be able to identify the type of function and its application onto binary operations.

CO3: Students should be able to calculate LCM & GCD using division algorithm and should be able to prove basic theorems and properties of integers related to it.

CO4: Students should know basic of complex numbers operations and can be able to solve complex problems using De Moivre's theorem.

CO5: Students should be able to find GCD of polynomials and example relating roots and coefficients of polynomials.

CO6: Students should be able reduce general equation of conic section into standard form and to identify the nature of it.

CO7: Students should know analytical geometry of three dimension specially of line and plane & sphere.

CO8: Students should be able to solve system of linear equations using different prescribed methods.

Title of Course: F.Y. B.Sc. /B.A Mathematics M-II (Calculus and DE)

CO1: Students are able to understand the basic of real valued function.

CO2: Students should be able to study tangent to curve leads to differential calculus and area under the curve under integral calculus and also the detail concept of limits and continuity.

CO3: Students should be able to solve various real life problems using knowledge of derivatives and integrations.

Title of Course : S.Y. B.Sc./B.A Mathematics M-I (Multivariable Calculus-I / Linear Algebra)

CO1: Students should know multivariable functions with graphs and level curves and able to find their limit & continuity.

CO2: Students should be able to solve the second and higher order partial derivatives of multivariable functions also for composite functions.

CO3: Students should apply derivatives to obtain gradient, directional derivatives of vectors and to find tangent planes and normal lines. Also to find extreme values of the function.

CO4: Student should be able to integrate multivariable functions in rectangular, cylindrical and spherical coordinates and apply it to find area and volumes.

CO5: Student should know vector spaces, subspaces, inner product spaces. They should be able to obtain basis, orthonormal basis, null space and range space, rank, nullity and apply Gram-Schmidt process for orthogonalization.

Title of Course: S.Y. B.Sc./B.A Mathematics M-II (Laplace Transform & Fourier Series / Numerical Methods and its Applications)

CO1: Student should know Laplace Transform of elementary functions, their properties, derivatives, integrals, gamma function, unit step and dirac delta function.

CO2: Student should know inverse Laplace transformation, their properties, derivatives, integrals and evaluation of integrals and apply them to solve ordinary differential equations.

CO3: Student should know Fourier series and its applications.

CO4: Student should be able to solve algebraic and transcendal equations by using different numerical methods.

CO5: Student should know different interpolation formulae and apply them to interpolate the given data.

CO6: Student should be able to fit straight line, curve, polynomial and exponential functions using least square method.

CO7: Student should be able to differentiate and integrate by different numerical methods.

CO8: Student should able to solve ODE by various numerical methods.

Title of Course : S.Y. B.Sc(Computer Science) Mathematics M-I (Applied Algebra / Computational Geometry)

CO1: Student should know vector spaces, subspaces. They should be able to obtain basis, orthonormal basis, null space and range space, rank, nullity.

CO2: Student should know linear transformation, transformation matrix and change of basis.

CO3: Student should be able to find eigenvalues and eigenvectors and using them to decide diagonalization of the matrix.

CO4: Student should know coding theory and its application.

CO5: Student should be able to transform two dimensional and three dimensional object by using different specified transformation matrix.

CO6: Student should know different types of 3-D projection.

CO7: Student should be able to plot 2D and 3D curves.

Title of Course : S.Y. B.Sc(Computer Science) Mathematics M-II (Numerical Analysis / Operation Research)

CO1: Student should be able to solve algebraic and transcendal equations by using different numerical methods.

CO2: Student should know different interpolation formulae and apply them to interpolate the given data.

CO3: Student should be able to differentiate and integrate by different numerical methods.

CO4: Student should able to solve ODE by various numerical methods.

CO5: Student should be able to formulate different life problems into LPP and solve them by using graphical method and simplex method.

CO6: Student should be able to solve and optimize transportation problems.

CO7: Student should be able to solve assignment problems.

CO8: Student should know game problems and find value of the game using optimum strategies.

Title of Course : T.Y. B.Sc Mathematics M-I (Metric space/ complex analysis)

CO1: Student should be able to define several standard examples of metric spaces and prove simple results related to them.

CO2: Student should be able to determine whether a given metric space has any of the properties openness, closeness, completeness, compactness and connectedness.

CO3: Student should be able to prove simple results related to all above notions.

CO4: Student should be able to demonstrate understanding of the basic concepts underline complex analysis and examples of these concepts

CO5: Student should be able to prove basic results in complex analysis and apply methods to evaluate definite integrals.

CO6: Student should be able to demonstrate understanding and appreciation of deeper aspects of complex analysis.

Title of Course: T.Y. B. Sc Mathematics M-II (Real analysis I, II)

CO1: Student should revise sets and functions of real valued functions.

CO2: Student should know sequence, subsequence, limit, convergent, divergent, monotone and Cauchy sequences.

CO3: Student should be able to demonstrate convergent, divergent and alternating series.

CO4: Student should know Riemann integral and fundamental theorem and mean value theorem of integral calculus.

CO5: Student should be able to differentiate improper integral of 1st, 2nd and 3rd kind and various test including convergence of series.

CO6: Student should be able to demonstrate point wise and uniform convergence of sequences of functions and series of functions with integration and differentiation.

Title of Course : T.Y. B.Sc Mathematics M-III (Metric space/ complex analysis/ Real analysis I, II)

CO1: Student should be able to solve variety of complex problems of M-I and M-II.

Title of Course : T.Y. B.Sc Mathematics M-IV (Group theory/ Ring theory)

CO1: Student should be able to apply axioms of group to different finite and infinite sets and classify various subsets with subgroup.

CO2: Student should be able to decide whether a given group is cyclic, find generators for subgroup of given order.

CO3: Student should be able to determine whether or not groups are isomorphic.

CO4: Student should be able to demonstrate rings, fields and integral domain and also can classify them.

CO5: Student should be able to demonstrate factor rings, prime and maximal ideals and homomorphism.

CO6: Students should be able to classify unique factorization and Euclidean domain and also demonstrate Gaussian integers and multiplicative norms.

Title of Course : T.Y. B.Sc Mathematics M-V (O.D.E/ P.D.E)

CO1: Student should be able to demonstrate O.D.E and classify with respect to order and linearity.

CO2: Student should be able to solve first and higher order O.D.E and exact differential equation.

CO3: Student should be able to apply the method of undetermined coefficients.

CO4: Student should be able to solve linear equations and power series.

CO5: Student should be able to demonstrate system of first order equation and their solution.

CO6: Student should be able to solve simultaneous differential equation and pfaffian differential equation in three variables.

CO7: Student should be able to demonstrate and solve orthogonal trajectories of a system of curves and surface.

CO8: Student should be able to classify integrals and various methods to solve first order partial differential equations.

Title of Course: T.Y. B.Sc Mathematics M-VI (Group theory/ Ring theory/ O.D.E/ P.D.E)

CO1: Student should be able to solve variety of complex problems of M-IV and M-V.

Title of Course: T.Y. B.Sc Mathematics M-VII (Operational Research/ Number theory)

CO1: Student should be able to formulate different life problems into LPP and solve them by using graphical method and simplex method.

CO2: Student should be able to solve and optimize transportation problems.

CO3: Student should be able to solve assignment problems.

CO4: Student should be able to calculate L.C.M and G.C.D using division algorithm and classify the numbers as prime and fermats numbers.

CO5: Student should be able to demonstrate properties of congruence's, residue classes, complete and reduce residue system and can be solve various problems on above notion.

CO6: Student should be able to demonstrate greatest integer functions.

CO7: Student should be able to solve Diophantine equations, Pythagorean triplet and quadratic residues.

Title of Course: T.Y. B.Sc Mathematics M-VIII (Graph theory/ Computational Geometry)

CO1: Student should be able to demonstrate graphs, its components, operations.

CO2: Student should be able to demonstrate tress and connectivity and can solve connector and shortest path problems.

CO3: Student should be able to solve Chinese postman and travelling salesman problems.

CO4: Student should be able to demonstrate directed graphs and their components.

Title of Course: T.Y. B. Sc Mathematics M-IX (Operational Research/ Number theory/ Graph theory/ Computational Geometry)

CO1: Student should be able to solve variety of complex problems of M-VII and M-VIII.