

DON BOSCO COLLEGE, SULTHAN BATHERY
Affiliated to University of Calicut
(A NAAC accredited & ISO 9001:2015 Certified Institution)
Department Name: Mathematics

Program Outcomes – UG Mathematics

- PO 1. **Critical Thinking:** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- PO 2. **Effective Communication:** Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
- PO 3. **Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings.
- PO 4. **Effective Citizenship:** Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- PO 5. **Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
- PO 6. **Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.
- PO 7. **Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Program Specific Outcomes – UG Computer Science

- PSO 1. Think in a critical manner.
- PSO 2. Know when there is a need for information, to be able to identify, locate,
- PSO 3. evaluate, and effectively use that information for the issue or problem at hand.
- PSO 4. Formulate and develop mathematical arguments in a logical manner.
- PSO 5. Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
- PSO 6. Understand, formulate and use quantitative models arising in social science, business and other contexts.

COURSE OUTCOMES

I Semester

BASIC LOGIC & NUMBER THEORY

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to real and complex numbers.

CO1	To define and recognize the basic properties of logic gates	Remembering
CO2	Ability to apply the theorem in a correct mathematical way	Applying
CO3	Analyse the solution set of a system of linear equations	Analysing
CO4	To demonstrate the basis of vector space	Understanding
CO5	To understand the definitions of congruences, residue classes.	Remembering

II Semester

CALCULUS OF SINGLE VARIABLE-1

CO1	Calculate limits, derivatives, and indefinite integrals of various algebraic and trigonometric functions of a single variable	Knowledge
CO2	Use the properties of limits and the derivative to analyze graphs of various functions of a single variable including transcendental functions	Understand
CO3	Utilize the definition of the derivative to differentiate various algebraic and trigonometric functions of a single variable.	Apply
CO4	Distinguish between the concepts of sequence and series, and determine limits of sequences and convergence and approximate sums of series	Analyse
CO5	Evaluate various techniques of integration and apply them to definite and improper integrals	Evaluate

III Semester

CALCULUS OF SINGLE VARIABLE-2

CO1	Define, graph, compute limits of, differentiate, integrate, and solve related problems involving functions represented parametrically and in polar coordinates	Knowledge
CO2	Illustrate differentiated and integrated functions represented as power series expansions, including Taylor series	Understand
CO3	Model and solve physical phenomena using integration/differential equations.	Apply
CO4	Distinguish between the concepts of sequence and series, and determine limits of sequences and convergence and approximate sums of series	Analyse
CO5	Evaluate various techniques of integration and apply them to definite and improper integrals	Evaluate
CO6	Solve problems in a range of mathematical applications using the	Create

	integral	
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IV Semester

LINEAR ALGEBRA

CO1	Define the terms vector spaces, eigen value, eigen vector, inner product spaces.	Knowledge
CO2	Illustrate the examples of matrices and how they used in vector space and inner product space.	Understand
CO3	Identify the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces	Apply
CO4	Analyze vectors in R^n geometrically and algebraically	Analyse
CO5	Evaluate and use determinants, inverse, , eigen vector	Evaluate
CO6	Solve the problems based on orthonormal sets and orthogonal diagonalization	Create

V Semester

VECTOR CALCULUS

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to real and complex numbers.

CO1	Recognize and find equation of lines and planes in space, cylindrical, quadric surface and revolution in space.	remembering
CO2	Students can illustrate the plotted area.	Applying
CO3	Easy to solve the applied optimization problems involving functions of two or three variables.	understanding
CO4	Students can compare the area of unshaped and shaped things	Analysing
CO5	Evaluate integral and use them to find volumes in rectangular spherical co-ordinates.	Evaluating

ABSTRACT ALGEBRA

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to groups, fields, rings and cosets.

CO1	Recall the terms set, permutation and binary operation	Remember
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CO2	Classify groups, subgroups, cyclic groups, alternating groups, normal subgroups etc.	Understand
CO3	Analyse and demonstrate examples of orbits, cycles, cosets, integral domain and quotient rings.	Analyse
CO4	Use the concepts of isomorphism and homomorphism for groups and rings	Evaluate
CO5	Produce rigorous proofs of propositions arising in the context of abstract algebra	Create

BASIC MATHEMATICAL ANALYSIS

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to real and complex numbers.

CO1	To define and recognize the basic properties of the field of real numbers	Remembering
CO2	Ability to apply the theorem in a correct mathematical way	Applying
CO3	Analyse and recognise the real functions and the limits	Analysing
CO4	To demonstrate the basis of complex numbers	Understanding
CO5	To demonstrate an understanding of limits and how they are used in sequences and differentiation.	Understanding

DIFFERENTIAL EQUATIONS

Course Outcomes:

CO1	Define differential equations of first order and second order, Laplace transforms and Fourier series	Knowledge
CO2	Illustrate examples of differential equations and Laplace equations	Understand
CO3	Solve and apply differential equations using the Laplace transform technique and Find power series solutions of differential equations.	Apply
CO4	Develop the ability to apply differential equations to significant applied and/or theoretical problems.	Create

VI Semester

REAL ANALYSIS

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to distinct types of Continuous functions, Riemann integral and Improper integrals of different kinds.

CO1	Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration.	Understand
CO2	Construct rigorous mathematical proofs of basic results in real analysis.	Apply
CO3	Analyse rigorous arguments developing the theory underpinning real analysis.	Analyse

CO4	Appraise how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.	Evaluate
CO5	Discuss fundamental properties of the real numbers that lead to the formal development of real analysis.	Create

COMPLEX ANALYSIS

Course Outcomes:

CO1	Demonstrate understanding of the basic concepts underlying complex analysis.	Understanding
CO2	Demonstrate familiarity with a range of examples of these concepts.	Understanding
CO3	Prove basic results in complex analysis.	evaluation
CO4	Apply the methods of complex analysis to evaluate definite integrals and infinite series.	Applying
CO5	Demonstrate understanding and appreciation of deeper aspects of complex analysis such as the Riemann Mapping theorem..	analyzing

NUMERICAL METHODS

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to real and complex numbers.

CO1	How numerical methods are used to obtain approximate solutions.	Knowledge
CO2	Demonstrate understanding of common numerical methods.	Understand
CO3	Apply numerical methods to obtain approximate solutions to mathematical problems	Applying
CO4	Distinguish numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear equations, and the solution of differential equations.	Analyse
CO5	Evaluate the accuracy of common numerical methods	Evaluate

BASIC LOGIC & NUMBER THEORY

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