**K.L.E. Society's**
# BASAVAPRABHU KORE ARTS, SCIENCE AND COMMERCE COLLEGE, CHIKODI – 591 201.
(Accredited at 'A' with 3.26 CGPA in 3rd Cycle of A & A)
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# DEPARTMENT OF MATHEMATICS

## COURSE OUTCOMES

## 2020-21

### Course I: Algebra-I and Calculus-I

$CO_1$:     Understand the concept of mean value theorems and its applications.

$CO_2$:     Able to find out the LUB and GLB of set.

$CO_3$:     Able to solve the examples based on absolute values and inequalities.

$CO_4$:     Able to define the limits and continuity and to solve examples based on it.

$CO_5$:     To understand the algebra of limits and continuity.

$CO_6$:     Able to state L-Hospital's rule and use it to compute limit of indeterminate forms

$CO_7$:     Understand the arithmetical properties and postulates of the real numbers.

$CO_8$:     Understand the relation between multiplication of two positive integers and any real number

$CO_9$:     Understand the concept of Leibnitz theorem and its applications

$CO_{10}$:     Students will understand the different types of matrices.

$CO_{11}$:     They understand the expansion of $4^{th}$ order determinants and properties of symmetric and skew symmetric determinants.

$CO_{12}$:     Understand the meaning of rank of matrix and properties of rank of matrix.

$CO_{13}$:     Computation of Sum, Difference, Product, Trace, Transpose, Rank, Inverse of a matrix and Solution of linear equation with the help of SCILAB.

$CO_{12}$:     Computation of $n^{th}$ order derivatives with the help of Maxima.

### Course II: Calculus-II and Solid gemotry.

$CO_1$:     Able to understand the concept of polar coordinates and polar curve.

$CO_2$:     Explain the concept of polar sub tangent and polar sub normal's.

$CO_3$:     Understand the concepts of curvature, radius of curvature in Cartesian and polar forms.

CO$_4$ Improving skill of solve examples on limits and continuity of functions of two variable.

CO$_5$: Explain the concept of Evolutes and Involutes.

CO$_6$: Understand the concept of equation of sphere, section of sphere by a plane

CO$_7$: Explain the concept of equation of cylinder, enveloping cylinder and right circular cylinder.

CO$_8$: Understand the concept of cone and its applications.

CO$_9$: Understand the concept of Reduction Formulas for integration.

CO$_{10}$: Understand the concept of Partial derivatives of first and second order.

CO$_{11}$: Explain the concept of Homogeneous function and applications of Euler's theorem.

CO$_{12}$: Understand the concept of tracing of curves with help of Maxima.

CO$_{13}$: Computation of length and Volume of standard curves with the help of Maxima.

## Course III: Mathematical Logic and Real Analysis

CO$_1$: Determine if a compound statement is negation, conjunction, disjunction, conditional or bi-conditional.

CO$_2$: Understand the concept of inverse, converse and contra positive and construct the truth tables for it.

CO$_3$: Determine if an argument is valid or invalid by using truth tables.

CO$_4$: Develop skills in constructing truth tables

CO$_5$: Derive rule for determining the general term of on arithmetic sequence.

CO$_6$: Able to solve problem on that involves arithmetic sequence.

CO$_7$: Derive rule for determining the sum of an arithmetic series.

CO$_8$: Understand the concept of Cauchy's first theorem and solve the examples on it.

CO$_9$: Understand an example of geometric sequence and solve problems that involves the geometric sequence

## Course IV: Group theory, Integral Calculus and Differential Equations

CO$_1$: Understand the concept of group, semi group, subgroup, cyclic group and their properties.

CO$_2$: Determine whether a given set and binary operation form a group by checking group axioms.

CO$_3$: Identify the cyclic group and their generators.

CO$_4$: Explain groups and subgroups using Lagrange's theorem

CO$_5$: Able to find the length of arc, surface areas and volume of solids of revolution for standard curves whose equations are given in Cartesian, polar and parametric forms.

CO$_6$: Understand the first order first degree differential equations.

CO$_7$: Improving skill of solve homogeneous, non-homogeneous, linear, Bernoulli's and exact differential equations.

CO$_8$: Able to solve non exact differential equations by finding the suitable integrating factors.

CO$_9$: Improving skill of solve differential equation of first order higher degree.

CO$_{10}$: Understand the concept of Clairtau's equation.

## Course V: Vector Calculus and Infinite Series

CO$_1$: Derive rule for determining the sum of n terms of geometric series and solve problems on it.

CO$_1$: Generalize rule for determining the sum of infinite geometric series and solve problems that involves a geometric sequence and series.

CO$_3$: Able to explain why a geometric series is convergent and divergent.

CO$_4$: Define concepts of point and vector and explain differences and similarities between them.

CO$_5$: Memorize algebraic definitions and explain geometric meanings of dot and cross products.

CO$_6$: Calculate directional derivatives and gradients.

CO$_7$: Able to solve the examples based on double and triple product, gradient, divergence and curl of vectors.

## Course VI: Group Theory, Fourier Series and Differential Equation

CO$_1$: Able to define normal subgroups, quotient groups.

CO$_2$: Understand the concepts of homomorphism and isomorphism of groups.

CO$_3$: Develop the skills on solving the problems on Fourier transforms.

CO$_4$: Able to define Periodic functions .fourier series of odd and even functions.

CO$_5$: Develop the skills on solving the problems on linear differential equation of nth order.

CO$_6$: Understand the concepts of higher order exact differential equations and its applications.

## Course VII: Real Analysis

$CO_1$: Understand the concept of beta and gamma functions and relation between them.

$CO_2$: Able to use beta and gamma functions to solve variety of problems.

$CO_3$: Understand the concept of recurrence formula and duplication formula.

$CO_4$: Understand the concept of double and triple integrals and develop the skills in solving the problems on it.

$CO_5$: Compute triple integrals in rectangular, cylindrical and spherical co-ordinates.

$CO_6$: Understand the Leibnitz's theorem and develop the skills in solving problems related to Leibnitz's theorem.

$CO_7$: Develop the skills on solving the problems on improper integrals.

## Course VIII: Numerical Analysis

$CO_1$: Able to use Bisection method, iteration method Newton Raphson method to solve the examples.

$CO_2$: Understand the concepts of Gauss Seidal method and its applications.

$CO_3$: Able to define forward and backward formulae.

$CO_4$: Able to explain formation of first and second linear difference equation with constant coefficients.

$CO_5$: Explain the concept of Eulers, Picard and Runge-Kutta method of order two.

## Course IX: Dynamics and Calculus of Variation

$CO_1$: Able to understand the concept of dynamics and kinetics.

$CO_2$: Able to explain velocity and acceleration of particle along plane curve.

$CO_3$: Understand the concepts of tangential and normal components of velocity and acceleration.

$CO_4$: Explain the concept of Euler's equation and its applications.

$CO_5$: Understand the concepts of Brachistochrone problem and isoperimetric problems.

## Course X: Differential Equations

$CO_1$: Develop the skills on solving the problems on simultaneous differential equation with two and three variables.

$CO_2$: Able to define concepts of Power series, ordinary and singular points.

CO$_3$: Understand the concepts of Frobenious method and its applications.

CO$_4$: Develop the skills on solving the problems on Charpits method

CO$_5$: Understand the concepts of Rodrigues formula and its applications.

## Course XI: Complex Analysis and Ring Theory

CO$_1$: Able to define analytic function, Cauchy-Reimann equations.

CO$_2$: Explain the Cauchy's theorem, Morera's theorem and its applications

CO$_3$: Explain the concepts of Residue theorem, Jordan's lemma and contour integration.

## Course XII: Topology and Laplace Transforms

CO$_1$: Able to define open set, closed set, closure of set and boundary points of set.

CO$_2$: Understand the concepts of base, sub-base, separation axioms.

CO$_3$: Develop the skills on solving the problems on Laplace transforms.

CO$_4$: Understand the concepts Dirac-delta function, unit step function and convolution theorem.

CO$_5$: Understand the concepts of convolution theorem and its applications.