**Hon. Mr. Govindrao Biradar**
President
Janseva Sevabhavi Pratishthan Bhopni

**Hon. Mr. Gajananji Biradar**
Secretary
Janseva Sevabhavi Pratishthan Bhopni

**Dr. Chandrakant A. Jawale**
M.Sc., B. Ed, P.hD. FZSI, FIAES, FISST
Principal
drcajawale@gmail.com 9421481557

# COURSE OUTCOMES FOR ALL UG PROGRAMMES

## Course Name: English

### Compulsory English

### B.Com/B.sc First Year

**Outcomes**

1) Through the course on linguistic skills, the learners will begin to use the English language in the best possible manner.

2) Through the close study of texts, students will develop knowledge, understanding and skills in order to communicate effectively in English

3) Learners will value and appreciate the importance of the English language as a key to learning.

4) Learners will gain the personal enrichment from study of literary pieces in English.

5) Learners will acquire ability to communicate through oral and written texts.

### Compulsory English

### B.Com/B.sc Second Year

Course Outcome: By the end of the course, students should be able to:

• Develop the passive skills of reading and listening to prose passages in English

. • Develop the active skills of writing and speaking in terms of writing notices, agendas and minutes, writing business letters and job application letters.

• Be acquainted with some functions of English language. •

Be acquainted with some situational English usage.

## B.Com/B.sc

### उद्देश्

१) द्वितीय भाषा के रूप में छात्रों को हिंदी भाषा और साहित्य का सामान्य परिचय देना।

२) कालअनुरूप कहानी और काव्य में आए परिवर्तन को समझना।

3) कहानी और काव्य के माध्यम से छात्रों को परिष्कृत करना।

४) छात्रों को हिंदी के व्यावहारिक ज्ञान से अवगत करना।

५) हिंदी भाषा के प्रति छात्रों पर रुचि उत्पन्न करना।

६) रचनाओं में व्यक्त समस्याओं के समाधान के लिए छात्रों को प्रेरित कर नैतिक मूल्यों को स्थापित करना।

### महत्व

साहित्य जीवन का पद्दर्शक है । वह मनुष्य के जीवन में सकारात्मक और रचनात्मक परिवर्तन लाने की क्षमता रखता है । इस दृष्टि से सामान्य हिंदी का अध्ययन कर विविध संकायों में पढ़ रहे छात्रों में हिंदी भाषा एवं साहित्य के प्रति रुचि उत्पन्न होती है । उन्हें व्यावहारिक हिंदी का ज्ञान प्राप्त होता है । इतना ही नहीं तो हिंदी कहानियां और कविताएं उनके मन मस्तिष्क को परिष्कृत करने में सहायता करती है । वे पठित रचनाओं के माध्यम से विविध समस्याओं से परिचित हो जाते हैं । और उन समस्याओं के समाधान के लिए प्रयास रत रहते

## B. Sc. & B. Com.SL Marathi

### अभ्यासक्रम - व्दितीय भाषा मराठी (Second Language)

### उद्दिष्टे

१. मध्ययुगीन व आधुनिक मराठी गद्य व पद्याचे स्वरूप विशेष समजून घेणे आणि सांस्कृतिक पार्श्वभूमी समजून घेणे.

२. मराठी वाङ्गय निर्मितीच्या प्रेरणांची उकल करणे,

३. मराठी साहित्याची आवड निर्माण करणे.

४. मराठी प्रमाण लेखनविषयक नियमा बद्दल जागृती घडविणे.

५. मराठी शब्दांलकारांचा परिचय करणे,

### उपयोगिता

१. मध्ययुगीन व आधुनिक गद्य पद्य वाक्याचा परिचय,

२. मराठीतील वाक्यप्रकारांची ओळख.

३. मराठी साहित्यनिर्मिती आणि त्यांच्या प्रेरणा यांचे आकलन,

४. मराठी भाषेतील व्याकरणाचे उपयोजन

५. मराठी गद्य पद्य घटकांच्या स्वरूपाचे ज्ञान.

# COURSE OUTCOMES FOR ALL UG PROGRAMMES
## BACHELOR OF SCIENCE

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## B.Sc. Botany:

### B.Sc. FIRST YEAR

**CCB-IA Theory Paper-I: Viruses, Bacteria Algae , Fungi , Lichens and Mycorrhiza**

1. To study and impart knowledge about the occurrence, distribution, structure and life history of lower plants such as algae, fungi, lichens
2. To instill in students an appreciation for the diversity of plant forms and structural organization that exists within plant bodies that allow plants to develop and live as integrated organisms in diverse environments.

CCB-IB Theory Paper-II: Plant Ecology , Phytogeography and Environmental Biology

1. Acquainted with basic concepts of Ecology , Ecosystem Ecological factors, communityecology and phytogeography
2. To provide students with skills necessary for Ecological studies

CCB-IIA Theory Paper-III: Bryophytes, Pteridophytes Gymnosperms and paleobotany

1. To study the occurrence, distribution, structure and life history of bryophytes, pteridophytes and gymnosperms.
2. To provide students with skills in paleobotany studies

CCB-IIB Theory Paper-IV: Taxonomy of Angiosperms

1. To study the types of classificationsartificial, Natural and phylogenetic
2. To study the principles and rules of ICN and taxonomical terminology
3. To study the various plant families and their economic importance

**CCB-IA Theory Paper-I: Viruses, Bacteria Algae , Fungi , Lichens and Mycorrhiza**

3. To study and impart knowledge about the occurrence, distribution, structure and life history of lower plants such as algae, fungi, lichens
4. To instill in students an appreciation for the diversity of plant forms and structural organization that exists within plant bodies that allow plants to develop and live as integrated organisms in diverse environments.

CCB-IB Theory Paper-II: Plant Ecology , Phytogeography and Environmental Biology

3. Acquainted with basic concepts of Ecology , Ecosystem Ecological factors, communityecology and phytogeography
4. To provide students with skills necessary for Ecological studies

CCB-IIA Theory Paper-III: Bryophytes, Pteridophytes Gymnosperms and paleobotany

3. To study the occurrence, distribution, structure and life history of bryophytes, pteridophytes and gymnosperms.

4. To provide students with skills in paleobotany studies

## CCB-IIB Theory Paper-IV: Taxonomy of Angiosperms
4. To study the types of classificationsartificial, Natural and phylogenetic
5. To study the principles and rules of ICN and taxonomical terminology
6. To study the various plant families and their economic importance

## B. Sc. SECOND YEAR
### CCB-IIIA Theory Paper-VI: Plant Anatomy

1. To know about the internal structure of the most evolved group of plants, the Angiosperm.
2. To study cells, tissues, meristem, epidermal and vascular tissue system in plants.
3. To acquire knowledge of tissue systems, histology and growth pattern in plants.

## CCB-IIIB Theory Paper-VII: Plant Physiology
1. To make students realize how plants function, namely the importance of water, minerals, hormones, and light in plant growth and development; understand transport mechanisms and translocation in the phloem, applications of plant physiology.
2. To acquaint the students with the types and their functions of different biomolecules and secondary metabolites
3. To know the role of different plant growth regulators in plant physiology

## CCB-IVA Theory PaperVIII: Plant Embryology
1. 1.To study the flowering and fruiting, reproduction process, role of pollinators, ovule fertilization, Endosperm and seed development in angiosperms.

## CCB-IVB Theory Paper-IX: Plant Metabolism and Biochemistry
1. To study of different pathways in Photosynthesis , respiration , nitrogen metabolism
2. To gain the knowledge of basic aspects and applications of plant tissue culture
3. To study the different aspects of genetic engineering and bioinformatics

## B. Sc. THIRD YEAR

### DSCB-I DSCB-I: Cell and Molecular biology (Theory PaperXII)

1. To know about the ultra structure of a cell, cell wall, cell membrane, cell organelles and chromosomes, cell cycle and cell division.
2. To study in detail the structure of DNA and RNA, protein synthesis, gene structure, gene mutation and related diseases.
3. To acquire knowledge of cell and molecular biology

## DECB-I DECB-I: Systematic Botany-I (Theory Paper-XIII)
1. To know about the fundamentals of plant classification.
2. To study in detail the principles of plant taxonomy.
3. To acquire knowledge of different families of polypetalae, gamopetalae and apetalae.

## DSCB-II DSCB-II: Genetics and Plant Breeding (Theory PaperXIV)
1. To study Mendelian genetics, gene interaction.
2. To study sex determination, linkage, sex linked inheritance and genetic variations.
3. To study various crop improvement methods in plant breeding.

1. To acquire knowledge of different families of monocotyledons .
2. To know about the principles of taxonomy 3. To study in detail the origin of angiosperms.

# B.Sc. Chemistry:

## B.Sc. FIRST YEAR

### Organic and Inorganic Chemistry Paper I

1. Student should learn basic concept of organic chemistry, Nomenclature.
2. Student get well acquainted with functional group in organic chemistry.
3. To understand the basic concepts and differences aliphatic hydrocarbons.
4. To know about term cycloalkane , cycloalkene and diene.
5. Learn and practice about organic compounds with their names.
6. Students learn some exceptional electronic configuration, trends and Periodicity in the following properties like atomic size, ionization energy, electron affinity & electronegativity.
7. To understand the inert gases forms compounds, different fluoride compounds of xenon.

### Physical and Inorganic Chemistry Paper II

1. Learning and understanding rules of logarithm, Rules of drawing graph, Derivatives, Integration , different mathematical concept and SI units, and their use in solving numerical.
2. Learning surface phenomena at heterogeneous surfaces.
3. Student will learn the basic knowledge of gas phase, Kinetic molecular theory, critical phenomenon , liquefaction and molecular velocities.
4. To impart knowledge about solid phase, crystallography and some crystal structure.
5. General characteristics of s-block elements, oxides, hydroxide, carbonate &its complexes
6. Study the oxidation and reduction by different methods.

### Organic and Inorganic Chemistry Paper III

1. Student should learn the concept of aromatic hydrocarbons, Aromaticity and antiaromaticity.
2. Student should understand the phenols and synthesis of phenols
3. Student knows about the haloalkene and haloarenes compounds.
4. To know the concepts of carboxylic acids and their derivatives.
5. To know about the types of alcohols and reaction of epoxide.
6. To study the different properties of P- block elements.
7. To know the acids & Bases by different concepts.

### Physical and Inorganic Chemistry Paper IV

1. To impart knowledge of atomic structure, different theories of atomic structure, rules of electronic configuration and quantum numbers.
2. Learning of properties of liquid phase as surface tension, Viscosity and parachor.
3. Student will learn the basic knowledge of colloidal state, types, preparation, properties and applications of colloidal state.
4. Learning and understanding of catalysis, types of catalysis and characteristics of catalyzed reactions.

5. To understanding the chemical bond and its different types of bonds.
6. Learning the Concept of hybridization and study of VSEPR & Molecular Orbital theory.

## B.Sc. SECOND YEAR

### Organic and Inorganic Chemistry Paper VI

1. Learn the mechanism of name reactions.
2. Know the Synthesis, and Reactions of Aromatic Carboxylic and Sulphonic acids.
3. Know the Synthesis, and Reactions of Organometallic compounds.
4. Learn the synthesis, mechanism, applications of active methylene compounds.
5. Gathering basic knowledge of Oils, Fats, Soaps and Detergents.
6. Understand the basic principle and application of Qualitative Analysis.
7. Know the Classification, Properties of Non- aqueous solvents.

### Physical and Inorganic Chemistry Paper VII

1. Write an expression of Davisson-Germer experiment.
2. Derive Schrondinger wave equation.
3. Understand De-Broglie's hypothesis and uncertainty principle.
4. Solve the numerical problems based on De-Broglie.
5. Understand concept of entropy.
6. Understand statements of first, second and third law of thermodynamics.
7. Know the meaning of phase, component and degree of freedom.
8. Know the nuclear structure & different energy of nuclear.
9. Understand the different steps & procedure in the gravimetric separation method.

### Organic and Inorganic Chemistry Paper VIII

1. Learn the stereoisomerism of Chiral compounds.
2. Know the Classification, and Reactions of carbohydrates.
3. Know the Synthesis, and Reactions of Nitrogen Compounds.
4. Gathering applications of Reagents in Organic Synthesis.
5. Understand the Characteristics of d-Block Elements.
6. Know the Characteristics of d-Block Elements

### Physical and Inorganic Chemistry Paper IX

1. Know the rate constant and factors affecting rate of reactions.
2. Write an expression for rate constant (K) for first order, second order reaction.
3. Know the terms cell constant, specific conductivity, equivalent conductivity and molar conductivity.
4. Know the applications of Kohlrausch's law.
5. Compare between thermal and photochemical reactions.
6. Discuss different types of photochemical process.
7. Know the preparation, properties, structure & application of different compounds.
8. Discuss different inter halogen compounds by preparation, properties, structure and uses.

### Organic and Inorganic Chemistry Practical paper X

1. Learn basics of thin layer chromatography and distillation.
2. Learn fundamentals of organic qualitative analysis.
3. Learn about organic estimations.
4. Basics of volumetric analysis.

## Physical and Inorganic Chemistry Practical Paper XI

1. Calculate normality and strength of the solution using potentiometer and conductivity meter.
2. Find pka value on pH meter.
3. Verify Lamberts-Beer's law colorimetrically and determine unknownconcentration of the solution.
4. Determine energy of activation.
5. Determine heat of solution.
6. Study the effect of solute on CST of phenol-water system.
7. Determine the enthalpy of ionization of weak acid / weak base.
8. Determine partition coefficient.
9. Separations of elements from each other & analysis by volumetric method.

## B.Sc. THIRD YEAR

### Organic and Inorganic Chemistry Paper XII

1. Learn the mechanism of Electrophilic Substitution reaction of Heterocyclic Compounds
2. Know the characteristics, Classification and synthesis of Drugs and Dyes
3. Explaining theories of Color and chemical constitution of Dyes
4. Gathering basic knowledge of Alkaloids, Vitamins and Pesticides
5. Understand the basic principle and application of coordination complexes
6. Know the application of elements in Medicine

### Physical and Inorganic Chemistry Paper XIII

1. Understand the concepts of molecular Spectroscopy and its applications
2. Analyze Rotational, Vibrational and Raman, Spectra
3. Interpret the theoretical and experimental methods of chemical kinetics Know the theory and application of Distribution law
4. Explain the Nomenclature, classification and application of Organometallic Compounds
5. Illustrate the classification and application of Metal Carbonyls

### Organic & Inorganic Chemistry Paper-XIV

1. To learn the basic principle and terms used in UV, IR & NMR Spectroscopy
2. Acquire the fundamental knowledge of classification and Synthesis of Amino Acidand Peptides
3. Describe the types of Rearrangement
4. Postulates and limitations of VBT and CFT
5. Calculation of CFSE for Tetrahedral and Octahedral Complexes
6. Explain the types of electronic transition and selection rule
7. Apply spectroscopic techniques in analyzing the structure of simple organic Molecules

### Physical & Inorganic Chemistry Paper-XV

1. Basic concepts of electrochemistry and its applications
2. Understanding the Nernst heat theorem and the Thermodynamics open system
3. Know the Vant-Hoff's Reaction isochore and numerical on it
4. Explain the types of magnetic substances and effect of temperature on it
5. Biological role of alkali and alkaline earth metal ions
6. Describe the structures and functions of Metal Cluster

## SEC III (Section-A) Computer Application in Chemistry OR Applied Analytical Techniques

1. Able to know the use of software and Excel in Chemistry
2. Grasp the concept of Quality Assurance and Quality Control
3. Illustrate the Physical and Chemical analysis of Soil and fuel
4. Be able to evaluate Biological activity and toxicity of oganic compounds using softwares

## SEC IV (Section-B) Spectroscopic Techniques and Cosmetic Preparation OR Basic Analytical Chemistry

1. Be able to determine the structure by using Spectra
2. To train the students for the preparation of various cosmetics
3. Know the classification and Fatty acid composition of Oils and Fats
4. Analysis of Oils and Fats by physical and chemical method

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# B.Sc. COMPUTER SCIENCE

## B. Sc. FIRST YEAR

### Basic of Computer Science (BCS-101)

1. To learn Basic Function of Devices like I/O, HDD etc.
2. To Understand the Fundamental of Software and Hardware. Understand the Concept of Operating System and Network.

### Introduction to Programming Language using C – (Part-I) (BCS-102)

1. To study of structure of programming languages, structure of c program.
2. To study different keyword for making program.
3. To develop programs using operators and control statement. To describe an array. Student are able to develop application software.

### Web Technologies (BCS-103)

1. Design and implement dynamic websites with good aesthetic sense of designing

### Elective: Office Automation (BCS104-A)

1. Understand the computer software, hardware, made available to simplify and automate a variety of office operations such as data processing, data manipulating and data presentation with various application those are presents in Microsoft office tools packages.

### Elective: Fundamental of Digital Electronics (BCS-104-B)

1. Can have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its applications in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. To develop skill to build and troubleshoot digital circuits

### Open Elective: Communication skills (BCS-105-B)

1. Understand and demonstrate Basic English usages for their different purposes.
2. Clear entrance examination and aptitude tests.
3. Write various letters, reports required for professional life.

### Operating Systems (BCS-201)

1. Fundamental understanding of the role of Operating Systems.

2. To understand the various memory management techniques
3. To apply the cons of process/thread scheduling
4. To understand the concept of a process and thread.

## Introduction to Programming Language Using C Part – 2 (BCS-202)

1. To describe a function, storage classes, structure, union, string and functions, Pointers, File Handling, Student are able to develop application software.

## Database Management Systems (BCS-203)

1. students will be able to think of ER modelling and creation of own database schema

## Elective – Desktop Publishing (BCS-204A)

1. Create personal documents such as business cards and resumes.
2. Create business documents such as flyers and advertisements.
3. Create a newsletter with graphics and draw objects.
4. Create a course project illustrating Desktop Publishing techniques.

## Elective – 8085 Microprocessor (BCS-204B)

1. To understand CICS and RISC based Microprocessor.
2. To understand techniques for faster execution of instruction and increase speed of operation of 8085 Microprocessor.
3. Write programs to run 8085 Microprocessor based system.

## Open Elective: Communication skills (BCS-205-B)

1. Understand and demonstrate Basic English usages for their different purposes.
2. Clear entrance examination and aptitude tests.
3. Write various letters, reports required for professional life.

## B. Sc. SECOND YEAR

## Object Oriented Programming (BCS301)

1. Ability to explain the difference between object oriented programming and procedural programming concepts.
2. Ability to program using object oriented features such as inheritance and polymorphism, operator overloading, dynamic memory allocation, file I/O, exception handling, etc
3. Ability to apply object oriented techniques to solve computing problems

## Computer Network (BCS-302)

1. Understand basic computer network technology.
2. Students can identify the different types of network topologies and protocols.
3. Students can Identify the different types of network standards.

## Data Structures and Algorithm (BCS2-303)

1. Ability to analyze algorithms and algorithm correctness.
2. Ability to summarize searching and sorting techniques
3. Ability to describe stack, queue and linked list operation.
4. Ability to have knowledge of tree and graphs concepts.

## Discrete Mathematics (BCS-304-A) (BCS-304 B)

1. Apply mathematical foundation to the discipline of Computer Science

## Mathematical Technique in Computer Science (MTCS)

1. Able to use standard mathematical techniques to solve elementary problem.
2. Understand the nature of mathematical proof & be able to write clear & concise proof

## (Open Elective) Numerical Abilities (BCS-305B)

1. Solve mathematical problems using analytical methods
2. Solve mathematical problems using computational methods
3. Students can develop design and analyze numerical techniques to approximate solutions to problems

## Programming in JAVA (BCS-401)

1. The knowledge of the structure and model of the Java programming language.
2. To use the Java programming language for various programming technologies
3. To develop software in the Java programming language.

## Software Engineering (BCS-402)

1. Ability to learn various methods of software development
2. Ability to apply various software testing techniques

## Relational Database Management Systems(BCS-403)

1. To study the basic concepts of relational databases
2. Learn and practice data modeling using the entityrelationship and developing database designs.
3. Understand the use of Structured Query Language (SQL) and learn SQL syntax for writingqueries.
4. Apply normalization techniques to normalize the databases.

## (Elective) Principle of Compiler Design (BCS-404A)

1. One can easily construct the recognizer system for language constructs as a input.
2. Understanding context free grammar.
3. Understanding various parsing techniques and intermediate code.

## (Elective) Essentials of computer security (BCS-404B)

1. To develop a basic understanding of cryptography
2. To develop a basic understanding of security policies.

## (Open Elective) Logical Reasoning (BCS-405)

1. Identify logical relations among statements.
2. Analyse logically complex statements into their truth functional or quantificational components
3. This enable students to develop their ability to reason by introducing them to elements of formal reasoning.

## B. Sc. THIRD YEAR

## Windows Programming (BCS501)

1. Review the fundamental concepts of Windows Programming in C#.Net
2. Evaluate the logic of different programming concepts.
3. Evaluate the techniques of application development in windows environment.
4. To develop database connectivity application.
5. To evaluate different techniques to develop windows applications.

## Python (BCS-502)

1. Write programs using Python programming constructs.
2. Design and Develop applications using Python programming.
3. Design object oriented programs with Python classes.
4. Use exception handling in Python applications for error handling.
5. Design and Develop applications connecting with database.

## Data Science (BCS-503)

1. Review the fundamental concepts of Data Science
2. Evaluate the techniques for better Data Science understanding.
3. Evaluate the techniques for perfect Data Analysis
4. To develop applications/algorithms in the field of Data Science
5. To evaluate different Data Science techniques & tools

## Software Testing (BCS-504A)

1. Ability to learn various methods of software development.
2. Ability to apply various software testing techniques.
3. Ability to evaluate cost of software testing.
4. Ability to implement different software testing according to types of software

## (Elective)Basics of Linux (BCS-504B)

1. Awareness of existing demanding trends in IT industry in order to get placement & research in open source market.
2. Understand the Linux OS architecture.
3. Install and use different types of distributions available in market.
4. Understand the different Linux basic commands.

## (Elective) System analysis and Design (BCS-505B)

1. To learn basic things of systems, System development Life cycle, and System Analyst.
2. To determine specific needs of system.
3. Discuss approaches and tasks of system. Planning for developing system
4. Evaluate tools and techniques.
5. Use appropriate methods and techniques to design software.
6. Implementation of Developed System, Evaluation and Testing of system

## Mobile Application Development (BCS-601)

1. Awareness of existing demanding trends in IT industry in order to get placement & research
2. Understand the Android OS architecture.
3. Install and use appropriate tools for Android development, including IDE, device emulator, and profiling tools.
4. Understand the Android application architecture, including the roles of the task stack, activities, & services.

## Fundamentals of Inage Processing (BCS-602)

1. Review the fundamental concepts of digital image processing system.
2. Evaluate the techniques for image enhancement.
3. Evaluate the techniques for Image restoration.
4. To develop color based image processing applications.
5. To evaluate different filtering method.

## (Elective) Softrware Process Management (BCS-604A)

1. Analyze software process maturity, its framework and the reference models

2. Understand the Capability Maturity Model and learn about conventional software management.
3. Understand how to manage software projects and project planning.
4. Analyze project tracking and control.
5. Understand the role of project closure analysis.

## (Elective) Linux Administration (BCS-604B)

1. Awareness of existing demanding trends in IT industry in order to get placement & research in open source market.
2. Understand the Linux OS architecture.
3. Install and use different types of distributions available in market.
4. Understand the different Linux administration commands.

## (Open Elective) Network Essentials (BCS-605)

1. Evaluate the usability of mobile devices such as smart phones.
2. Select appropriate network technologies in commercial and enterprise applications.

# B.Sc. MATHMATICS

## B. Sc. FIRST YEAR

### Paper 01: Differential calculus

1. Understanding concept of Limit, Continuity of Single and two variable Functions.
2. Find the Higher order derivatives of Product of Functions
3. Expand functions in terms of infinite series.
4. Find Equation of Tangent, Normal and Length of Tangent, Normal, Sub-tangent, Sub-normal.
5. Understanding of Mean Value Theorem concepts.
6. Understand the concept of Partial differentiation.
7. Use the results to solve problems.
8. Differentiate difference between derivative of single variable and Severable Variables.

### Paper 02: Algebra and Trigonometry

1. 1.Add, Subtract and Multiply two Matrices.
2. 2.Recognize the different types of Matrices.
3. 3.Find the Inverse of invertible Matrices.
4. 4.Determine the Rank of a Matrix.
5. 5.Transform matrix to Row Echelon form
6. Solve the System of Linear Equations.
7. Find the Characteristic Roots and Characteristic Vectors of a Square Matrix.
8. Check that every square matrix satisfies its own Characteristic Polynomial.

### Paper -03 Integral Calculus

1. Apply method of integration to find the integral of function.
2. Solve examples of definite integrals using Properties definite integrals.
3. Find the area and volume of given shape.
4. Understanding concept of Gamma and Beta Functions.
5. Solve problems on Multiple Integrals

1. Understanding concepts on Three Dimensional Geometry.
2. Find equations of Right lines, Planes, Spheres, Cones and Cylinders.
3. Find the Direction cosines of any line under the different given conditions.
4. Understand the intersection of any two or three, three dimensional geometrical figures.
5. Transform the equation of a plane to the normal form.
6. Transform equation of line from the unsymmetrical to the symmetrical form.
7. Find the length of perpendicular from a point to a plane.
8. Find the angle of intersection of two spheres.
9. Understanding concepts of plane of contact

1. Understand the basic tools of MATLAB.
2. Student can use MATLAB to solve the linear equations .
3. Students are able to use MATLAB for the findings of Eigenvalues and Eigen vectors.
4. Students are able to plot the two dimensional and three dimensional graphs .
5. Students are able to use for solving Differential Equations.

## B. Sc. SECOND YEAR

### Paper 06 :- Real Analysis-I

1. Understand basic concepts of sets and their properties.
2. Understand concept of Neighborhood of a point , interior [point of a set, open sets
3. Understand concept of limit point of a set , closed sets , closure of a set dense set.
4. Understand basic concepts of sequences , subsequences, bounds of sequences , limit pointof sequences and subsequences.
5. Understand the concept of Cauchy sequence and general principle of convergences. anddifferent
6. types of sequences..
7. Understand concept of infinite series Different types of series , general principle ofconvergences
8. of series some standard tests for convergence of series.
9. Understand the application of sequences and series to physical sciences such as Fourier'sseries.

### Paper – 07 : Group Theory

1. Understand the concepts on an equivalence relation.
2. Find the examples of equivalence relation.
3. Check whether the given set is a group with respect to given operation or not.
4. Understand general properties of groups.
5. Solve problems on groups.
6. Understand the concepts on cyclic group.
7. Use Lagrange's theorem to solve the problems in number theory.
8. Form a quotient group.
9. Find the kernel of a group homomorphism.

### Paper :- 08 Ordinary differential Equations

1. Understanding concept of solution of differential equations, order and degree. Transformthe equations into variable separable form.
2. Transform first-order non-homogeneous equation in x and y to homogeneous equation in xand y and solve it.
3. Find the equations that can be resolved into components equation and solve it. SolveClairaut's equation.

4. Find the solutions when the auxiliary equations are equal, different, repeated, and imaginary roots.
5. Find the solution of the exact differential equation, rules of finding the integrating factor.
6. Transform non-linear equation to linear equation and solve it.
10. Find integral corresponding to a term of the form e ax, xm, sin ax or cos ax, e axV, xV, x2V in the second member. 10. Find the solution of linear equation with variable coefficients. 11. Transform the equations to the homogeneous linear form.

## Paper :- 09:- Real Analysis-II
1. Understand meaning of interval, subinterval, partitions and their refinement.
2. Understanding basic concept of upper integral and lower integral and Riemann integral.
3. Understanding difference between upper sum, lower sum and Riemann sum
4. Acquire the idea about Riemann Inerrability and Riemann Integration
5. Understand various theorems associated with Riemann Integration
6. Develop a knowledge about Riemann Integration and applies into problems
7. Understand the meaning of improper integral.
8. Determine convergence of improper integrals with discontinuities in their domain or infinite limits of integration.
9. Develop skill in checking the convergence of improper integral using various tests of convergence
10. Understanding distinguishes between convergence and absolute convergence of improper integral.
11. Use comparison test with a corresponding improper integral with other improper integral to decide
11. whether improper integral converge or diverge
12. Use the results to solve some problems.

## Paper – 10 : Ring Theory
1. Understand given algebraic structure is a Ring or not.
2. Construct the examples of ring with known examples of ring.
3. Differentiate between zero-divisors and non zero-divisors in a given ring.
4. Check whether given two rings are isomorphic or not.
5. Check whether given ideal of a ring is a principal ideal or not.
6. Understand the concepts on principal ideal ring.
7. Understand concepts on Euclidean rings.

## Paper – 11 : Partial Differential Equations
1. Classification of PDE.
2. Solve linear as well as non-linear PDE of first and second order.
3. Apply PDE techniques to predict the behavior of certain phenomena.
4. Solve real problems by identifying them approximately from the perspective of PDE.
5. Mathematical formation of real problem precisely.
6. Solve problem using boundary conditions.

**Paper No 12 :- Metric Spaces**

1. How the various types distances are to be define on a same set.
2. Student can understand the concepts of open sphere and closed sphere.
3. Student can understand the concept of open and closed sets.
4. Student can understand the concepts of subspaces.
5. Student can understand the concepts of positions of a point in the space i.e. Adherent point,limit
6. point, Boundary point , Interior of a set and exterior of a sets 6. Student can understand theconcepts convergences and completeness.
7. Student can understand the concept of fixed point and Banach principle. .
8. Student can understand the concepts of continuity and uniform continuity
9. Student can understand the concept of compact and non compact sets.
10. Various properties of compact sets,
11. Student can understand the concepts of connectedness of sets.
12. After completion of this course student can aware with basic concepts of functional analysis.

## Paper – 13 : Linear Algebra

1. Define a vector space.
2. Check subsets for being subspaces.
3. Decide whether the given vectors are linearly dependent or independent.
4. Find dimension of the given vector space.
5. Find basis of the given vector space.
6. Construct orthonormal basis from given basis.
7. Find lengths of vectors and decide about their orthogonality.
8. Apply linear transformations through matrix approach.

## Paper – 14 : Numerical Analysis

1. Know the various forward and backward operators
2. Understand the difference between equal and unequal differences
3. Concepts of central differences
4. Understand the process of numerical differences.
5. Understand the process of numerical Integrations
6. Understand how to solve the differential equations numerically
7. Process of errors in the solutions.
8. Students can understand the difference between the continuous and discrete processes.

## Paper –15 Complex Analysis

1. 1 Understand difference between real number system and complex number system.
2. Understand various forms of complex number system
3. Understand the concepts of limit, and derivative of functions of complex variables.
4. 4 Understand the Sufficient condition for Differentiability.

5. Understand the Concepts of Analytic functions and harmonic functions,
6. 6 . Understand the concepts of , Exponential and Logarithmic functions.
7. .Understand the concept of Trigonometric and hyperbolic functions.

## Paper – 16 : Integral Transforms

1. Know the way integral transforms are defined.
2. Understand the applicability and utility of integral transforms.
3. Find Laplace transforms for standard and general functions.
4. Find Laplace transforms of derivatives, integrals, multiples and of periodic functions
5. Find inverse Laplace transforms of functions.
6. Apply shifting properties.
7. Solve individual differential equations and their systems with initial conditions.
8. Find Fourier Complex, Fourier sine and Fourier cosine transforms for functions.

## Paper 17 (A) Topology / Mechanics

1. 1 Understand Concept of Topological spaces ,
2. 2Understand Topological Properties of Sets.
3. 3.Understand the concept of order Topology and product topology
4. Understand concept of Subspace topology.
5. Understand Concept of Closed sets limit points.
6. Understand of continuity.
7. Understand the separation properties like Hausdroff Spaces.
8. 8 Understand Concept of Connected Spaces and compact Spaces.

B.Sc. FIRST YEAR

## Mechanics and Properties of Matter Paper – I

1. Apply knowledge of the properties of matter, thermodynamics, and atomic and nuclearphysics to explain natural physical processes and related technological advances.
   Use an understanding of elementary mathematics along with physical principles toeffectively solve problems encountered in everyday life, further study in science, and inthe professional world.
2. Design experiments and acquire data in order to explore physical principles, effectivelycommunicate results, and critically evaluate related scientific studies. Assess the contributions of physics to our evolving understanding of global change and sustainability while placing the development of physics in its historical and cultural context

## Mathematical Methods in Physics CCP I - (Section B) P-II

1. After completion of this course students will be able to apply the concept of vectors and complex variables to various physical quantities. This course will also enable the students tosolve the problems related to partial differentiation. Fourier analysis unit will enable the students to analyze the periodic functions.

## Heat and Thermodynamics Paper – III

1. Students understand the workings of various types of thermometers and the varioustemperature scales they employ.
2. Students clarify the relationship of molecular motion to temperature.Students understand heat as energy
3. Students distinguish between the concepts of heat and temperature Students define several heat units such as calories, kilocalories, British thermal units and torelate them to other energy units.
4. Students state the first Law of Thermodynamics and understand its implications.Students describe heat engines.
5. Students state the Second Law of Thermodynamics and understand its implications.

## Title of the Course: Electricity and Magnetism CCP II - (Section B) P-IV

1. Understand the characteristics and properties of electric and magnetic fields.
2. Experiences electricity & magnetism in practice mode and students enable to understandthe role of electricity in day to day life.
3. Students also understand the working principles and applications of various electricalComponents.
6. The properties of static electric and magnetic fields and how they arise.
4. The properties of simple, time-dependent electric and magnetic fields and what kind of physical phenomena they generate.
7. Students develop an appreciation of the concepts of order, disorder and entropy.

## CCP III - (Section A) P-VI Core Paper: Waves and Oscillations

1. Understand the concepts of mechanics, acoustics
2. Understand physical characteristics of SHM and obtaining solution of the oscillator using differential equations
3. Calculate logarithmic decrement relaxation factor and quality factor of a harmonic oscillator
4. Use Lissajous figures to understand simple harmonic vibrations of same frequency and different frequencies
5. Solve wave equation and understand significance of transverse waves
6. Solve wave equation of a longitudinal vibration in bars free at one end and also fixed at both the ends

## CCP III - (Section B) P-VII Core Paper: Statistical Physics, Electromagnetics and Theory of Relativity

1. After taking this course students are able to determine the probability of any type of events.
2. They are able to interpret different types of events.
3. Students have understood the concept of phase space and its volume.
4. They can easily distinguish between different types of particles and statistics and can easily distribute bosons, fermions and classical particles among energy levels.
5. After studying Fermi Dirac statistics, students have learn to deal with many electron system in real life.
6. Understand the relation in between Electromagnetic theory.
7. Explain various phenomenon in light of maxwell equations.
8. Establish the non-existence of the hypothesized stationary ether through the null result of Michelson-Morley experiments with interferometer.
9. The students shall be familiar with the fundamental principles of the general theory of Relativity

## CCP IV - (Section A) P-VIII Core Paper: Optics and Lasers

1. Gain knowledge on various theories of light
2. Acquire skills to identify and apply formulas of optics and wave physics
3. Understand the properties of light like reflection, refraction, interference, diffraction etc
4. Understand the applications of diffraction and polarization.
5. Understand the applications of interference in design and working of interferometers.
6. Understand the resolving power of different optical instruments.
7. Gain knowledge in lasers and optical fiber and their applications in communication

## Basic Electronics Paper – IX

1. Identify and understand construction and properties of different types of P-N junction diodes.
2. Apply knowledge of semiconductor devices to use them in different combinations to see their applications as amplifiers and oscillators.
3. Design different circuits using semiconductor devices and demonstrate their usage.

## DSEP I (Section A) - Discipline Specific Compulsory Paper: Quantum Mechanics

1. You will be familiar with the main aspects of the historical development of quantum mechanics and be able to discuss and interpret experiments that reveal the wave properties of matter, as well as how this motivates replacing classical mechanics with a wave equation.
2. You will understand the central concepts and principles in quantum mechanics, such as the Schrödinger equation, the wave function and its interpretation, the uncertainty principle, the relation between quantum mechanics and linear algebra. This includes an understanding of elementary concepts in statistics, such as expectation values and variance.
3. You will be able to solve the Schrödinger equation on your own for simple systems in one to three dimensions, both analytically and by using robust numerical methods. You will have developed an understanding of why both analytic and numerical
4. solutions are important in quantum mechanics, and have acquired experience in using both types of methods on quantum mechanical problems.
   You will be familiar with the wave mechanics.
5. The student has gained knowledge about the time-dependent and time-independent Schrödinger equation for simple potentials like for instance the harmonic oscillator and hydrogen like atoms.

## A - DSEP I (Section B) – Discipline Specific Elective Paper: A. Solid State Physics

1. Students will be able to classify the materials in different classes based on their physical, thermal, electrical, and magnetic properties
2. Students will be able to analyze different types of matter depending on nature of chemical bonds and their properties
3. Students will be able analyze the crystal structures by applying crystallographic parameters.
4. Students will be able to determine the crystal structure by analysis of XRD data
5. Students will be able to evaluate and analyze the electrical and thermal properties of solids
6. Students will be able to analyze electron transport and energy related problems by applying quantum mechanical principles

## DSCP II (Section A) - Discipline Specific Compulsory Paper: Atomic, Molecular & Nuclear Physics

1. Describe theories explaining the structure of atoms and the origin of the observed spectra. Identify atomic effect such as Zeeman Effect and Stark Effect.
2. Explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields.
3. Solved the fundamental puzzle of the existence of strong nuclear force. Nuclear Physics include various interesting branches such as radioactivity, fission and fusion reaction nuclear

4. reactors etc. that has huge applications for the benefits of society.Understand the nature ofapproximations made on the quantum description of atomic and molecular systems.

1. After competition of this course students will be in a position to know the Principle, working and importance of communication systems i.e., modulators, demodulators, transamitters and receivers, etc.Analyze generation and detection of AM & FM signalIdentify different radio receiver circuits and role of AGC.

2. Importance of the different types of the number systems, different types of the LogicgatesBoolean laws and K-map in the branch of digital electronics.

# B.Sc. ZOOLOGY

## B. Sc. FIRST YEAR

### Paper-I: Biodiversity of Invertebrates

1. The student will be able to identify a given invertebrate upto class level.
2. Ability to understand the contribution of Invertebrates in the biodiversity index of any given habitat.
3. Ability to understand and appreciate the ecological and economic importance of invertebrates and vertebrates.
4. Ability to identify and describe external morphology and internal anatomical features of representative invertebrate species.

### Paper-II: Biodiversity of Chordates

1. The student will be able to identify and understand the Biodiversity of Chordates.
2. Ability to understand anatomical relation between different vertebrate classes.
3. The learner will be able to understand the economic importance of Chordates.

### Paper-III: Comparative Anatomy of Vertebrates

1. The student will be able to identify and understand comparative anatomical structure of vertebrate organ systems.
2. The learner will be able to understand the evolution of various organs and systems in the vertebrate body according to its environment.
3. Understand the plasticity of organ systems to adapt to the environment and acquire different novel forms.

### Paper-IV: Comparative Anatomy of Vertebrates

1. The student will be able to explain the basics processes of vertebrate embryonic development.
2. Ability to describe the various steps in vertebrate development.
3. Identify and explain about the different embryonic structures.
4. Describe the functions of different extra-embryonic structures.
5. Understanding of the Assisted Reproductive Technologies.

## B. Sc. SECOND YEAR

### Paper-VI: Physiology

1. Monitor their blood pressure and identify blood groups.
2. Understand function and types of heart & circulatory system.
3. Appreciate the basic function of kidney, main function of nerves.
4. Acquire knowledge on the nature and functions of hormones and learn the mechanism of hormone action.
5. Learn the structure and functions of Endocrine glands.

6. Understand the structure, development and function of reproductive organs in human.

1. Understand the chemical structure and functions of various biomolecules
2. Learn the signaling of biomolecules in cell membrane.
3. Understand the correlation between metabolism of different types of biomolecules.

1. Understand the structure and function of the cell as the fundamentals for understanding the functioning of all living organisms.
2. Understand structures and various cellular functions associated with the macromolecules found in cells.
3. Acquire knowledge of Mendelian Genetics and its Extension.
4. Graduates will be able to explain and interpret various processes, phenomena, states and
5. evolutionary tendencies at a biological system level.

1. Understand the theories and concepts of evolution.
2. Learn the process of evolution in animals.
3. Understand the patterns of evolutionary changes in animals.
4. Understand the organization and functions of genetic material in the living world.
5. Understand the Recombinant DNA Technology.

## B. Sc. THIRD YEAR; SEMESTER –V

### Paper-XII: Ecology and Zoogeography

1. Establish relationship between different groups of organisms in an ecosystem.
2. Appreciate and explain the role of plants, animals and other organisms in a habitat.
3. Evaluate effect of each group of organisms on others.
4. Identify issues with Suggest methods and approaches to improve health of an ailing ecosystem.

1. Understanding of taxonomy of fish.
2. Knowledge of feeding methods and habits of fish.
3. Knowledge of general fish anatomy and morphology.
4. Knowledge of hydro-geography of India.

1. Knowledge and understanding of different forms of behavior in animals.
2. Ability to explain and apply basic biometric computation methods.
3. Describe and elaborate about the different software and techniques in bioinformatics.
4. Use different biological databases to retrieve biological information.

1. Knowledge of various types of aquaculture and culture methods and Maricultlure.
2. Understanding of fishery science, with a particular focus on the biology, assessment, and management of fish and invertebrate fisheries.
3. Awareness about man-made hazards to aquaculture.
4. Knowledge of role of Larvivorous fishes in relation to public health.
5. Awareness of the role of Government in aquaculture development.

# Bachelor of Computer Application (BCA)

## Course Outcome(s):

Every individual course under this program has course objectives and course outcomes (CO). The course objectives rationally match with program educational objectives. The mapping of CO is as illustrated below.

## B.C.A. First Year

### Semester I

**Name of Subject Fundamentals of Computer Science and Information Technology**

Outcome To learn Basic Function of Devices like I/O, HDD etc. To Understand the Fundamental of Software and Hardware. Understand the Concept of Operating System and Network.

**Name of Subject Office Automation**

Outcomes After completion of this course student will be able to understand the computer software, hardware, made available to simplify and automate a variety of office operations such as data processing, data manipulating and data presentation with various application those are presents in Microsoft office tools packages.

**Name of Subject Programming in C**

Programming in 'C' Outcomes To study of structure of programming languages, structure of c program. To study different keyword for making program. To develop programs using operators and control statement. To describe an array, structure, union, string and functions. Student are able to develop application software.

**Name of Subject Elective: Element of Statistics**

Outcomes: 1. Explain the use of data collection & statistics. 2. Recognize, examine & interact the basic principles of describing and presenting data.

**Name of Subject Elective: Mathematical Technique in Computer Science (MTCS)**

Outcomes:  Able to use standard mathematical techniques to solve elementary problem.•  Understand the nature of mathematical proof• & be able to write clear & concise proof.

**Name of Subject Open Elective: University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses. OR**

**Name of Subject Open Elective: Applied English**

Course outcome: By the end of this course students should be able to: 1. Understand and demonstrate Basic English usages for their different purposes. 2. Clear entrance examination and aptitude tests. 3. Write various letters, reports required for professional life.

**Name of Subject Open Elective: Business Communication**

Course outcome: By the end of this course students should be able to: 4. Understand and demonstrate Basic English usages for their different purposes. 5. Clear entrance examination and aptitude tests. 6. Write various letters, reports required for professional life.

Name of Subject Lab-Course : CProgramming

Name of Subject Lab-Course : Office Automation

## Name of Subject: JavaScript

Course Outcomes: After successful completion of this course, students should be able to: I. Students will be a Front-End website developer. II. JavaScript ensures student to have a responsive, mobile-first website. III. It paces up the development process by offering resources such as templates and themes, which can be customized according to the project needs.

## Name of Subject Graphics Design and Content Management Tools

Course Outcomes: After successful completion of this course, students should be able to: i. Utilize several Flash tools and tactics learned throughout the course to produce an interactive flash based website. ii. Publish flash movies in numerous formats and contexts in a professional and web friendly manner. iii. Know types of databases and how to design them. iv. Know advanced queries and advanced concepts in MySQL. v. Plan website by choosing colour schemes, fonts, layouts, and more. vi. Select, install, and activate a theme in word press. vii. Design e-commerce site using woo commerce plugin.

## Name of Subject Web Technology

Outcome: 1. Be able to use HTML programming

## Name of Subject Elective : E-Commerce

Outcome: At the end of the course, the students is expected to realize the problems involved in designing and building e-commerce systems; understand the need to design EC systems that fully meet the requirements of the intended users; appreciate the need to ensure that the implementation of a design is adequately tested to ensure that the completed EC system meets the specifications.

## Name of Subject Elective : Business Accounting with Tally

Outcome: 1. Students will able to do Accounting Using Tally

## Name of Subject Open Elective: Functional English

Course outcome: By the end of this course students should be able to: 1. Understand and demonstrate Basic English usages for their different purposes. 2. Clear entrance examination and aptitude tests. 3. Write various letters, reports required for professional life.

## Name of Subject Open Elective: Corporate English

Course outcome: By the end of this course students should be able to: 1. Understand and demonstrate Basic English usages for their different purposes. 2. Clear entrance examination and aptitude tests. 3. Write various letters, reports required for professional life.

## Name of Subject Lab-Course: JavaScript

Course Outcomes: After successful completion of this course, students should be able to: i To develop background knowledge as well as core expertise in JavaScript. ii To understand the Dynamic form creation and provide knowledge for creating applications. iii To learn the advanced JavaScript.

Name of Subject Lab-Course : Web Technology

## B.C.A. Second Year

### Semester III

### Name of Subject Programming in C++

Programming in C++ Outcomes  Students are able to define objects which the core part of object oriented•
programming languages.  It helps to develop and build logic for programming among the learners.•
Students are able to develop application software using C++.

### Name of Subject Operating System Concepts

Operating System Concepts Outcome To understand the different Concept of Operating System

### Name of Subject Database Management System

Database Management System Outcomes:  Able to master the basic concepts and understand the
applications of database systems.•  Able to construct an Entity-Relationship (E-R) model from specifications
and to•  transform to relational model.  Able to construct unary/binary/set/aggregate queries in Relational
Algebra.•  Understand and apply database normalization principles.

### Name of Subject Elective : Business Application and ERP

Business Application and ERP Outcomes After completing this course, student will be able to 1. Make basic
use of Enterprise software, and its role in integrating business functions 2. Analyze the strategic options for
ERP identification and adoption. 3. Design the ERP implementation strategies. 4. Create reengineered
business processes for successful ERP implementation.

### Name of Subject Elective - Introduction to Multimedia

Introduction to Multimedia Outcomes Student will learn the different content forms of Multimedia such as
text, audio, images, animations, video and interactive content.

### Name of Subject Numerical Aptitude

Numerical Aptitude Outcomes On successful completion of the course the students will be able to
understand the basic concepts of numerical ability.

Name of Subject Lab-Course : C++ Programming

Lab/Practical Lab Course : DBMS

### Semester IV

### Name of Subject Programming in JAVA

Programming in JAVA Outcomes  Students learn about the concepts like interface, packages etc.•  Students
are able to develop stand-alone Java applications and web applications.•

### Name of Subject Data Structure and Algorithm

Data Structure and Algorithm Outcome Students are able to create and use various data structures like
Strings, Arrays, Linked Lists, and Trees.

### Name of Subject RDBMS

RDBMS Outcomes The course will demonstrate an understanding of the basic & advanced features of RDBMS. The course will demonstrate the various database tables and joins them using SQL commands, able to develop structured query language (SQL) queries to create, read, update, and delete relational database data.

## Name of Subject Operational Research

Operational Research Outcomes Recognize and develop operational research models from the verbal description of the real system and know the mathematical tools that are needed to solve optimization problems.

Name of Subject Computer Graphics

Computer Graphics Outcomes:  Knowledge of working of display systems.• Skill to execute various Scan Conversion algorithms in laboratory so as to draw Graphics• primitives.  Familiarization with 2D graphics.• Skill to execute various 2D transformations on graphics.•  Use of various graphics packages/functions on graphic.•
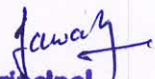
## Name of Subject Logical Reasoning

Logical Reasoning Outcomes Understand the basic concepts of logical reasoning skills. Solve campus placements aptitude papers and various competitive exams.

Name of Subject Lab-Course : JAVA Programming

Name of Subject Lab-Course : RDBMS

IQAC-COORDINATOR
Kal.Ranka Mahavidyalaya, Deoni
Tq.Deoni Dist.Latur

Principal
Kal. Ranka Mahavidyalaya, Deoni
Tq. Deoni Dist. Latur